DEMONSTRATING EMISSIONS TRADING IN TAIYUAN, CHINA

Can market-based instruments be effective in a country where monitoring and enforcement systems are still untested and state enterprises are the biggest polluters?

Richard Morgenstern, Robert Anderson, Ruth Greenspan Bell, Alan Krupnick, and Xuehua Zhang

U.S. HAS NO ROLE IN U.N. TREATY PROCESS; SENATE RELUCTANT TO RATIFY

Thirteen global environmental treaties have gone into force in the last three decades, but the United States is party to only half of them.

J.W. Anderson

PRODUCING OIL OR REDUCING OIL: WHICH IS BETTER FOR U.S. ENERGY SECURITY?

When it comes to lowering the risk of an energy shock to our economy, measures to reduce domestic oil demand outperform measures to increase domestic oil supply.

Heather L. Ross

WHO IS PROTECTING RUSSIA’S NATURAL RESOURCES? WHY SHOULD WE CARE?

While it’s unlikely that the American public is fretting over Russia’s natural environment, it should.

Kris Wernstedt

IS GASOLINE UNDERTAXED IN THE UNITED STATES?

Even though the environmental and public safety benefits from higher taxes could be substantial, the United States has the lowest gasoline tax among industrial countries for a number of reasons.

Ian W.H. Parry
A month or so ago, I participated in a fascinating conference organized by Fortune magazine, which was attended by interesting people from the United States and around the world. During a panel discussion on climate change in which I participated, one of the speakers correctly pointed out that global warming was an “externality”—that is, a consequence of fossil fuel use that doesn’t get factored into energy producers’ or users’ decisions. If we only knew, he said, how much the environmental and other unpriced consequences of gasoline consumption were, for instance, we could tax it appropriately and let the market then decide how much should be used. He thought $7.00 per gallon might be the appropriate tax and some others nodded approvingly.

What a wonderful moment to be the president of Resources for the Future! On my way to the conference, I had used the flying time to get caught up on recent research done by my colleagues. One of the things I had just read dealt with, of all things, the “optimal” tax on gasoline. My colleague Ian Parry, in collaboration with Kenneth Small of the University of California at Irvine, has been reviewing the literature on the adverse consequences of gasoline use—environmental, security, congestion, and safety-related. They find, as you will see in the article in this issue, that the tax that would “internalize” all these negative effects would be about $1 per gallon in the United States and about $1.35 per gallon in the United Kingdom (whence Mr. Parry originally hails). As I pointed out to the conference, this would be about two-and-a-half times the current average combined federal and state taxes on gasoline in the United States (40¢ per gallon) and less than half of the present federal tax on gasoline in the United Kingdom ($2.80 per gallon).

Three quick caveats are in order. First, Parry and Small are very careful to point out that attaching dollar values to things like the health consequences of polluted air, the time lost sitting in stalled traffic, or the macroeconomic benefits of reducing our use of imported oil is tricky work. Not surprisingly, their findings on optimal taxes are sensitive to the values for these things they find in the open literature. Second, democracies tax for reasons wholly unrelated to negative externalities. As we are reminded each April 15th in the United States, for example, we tax labor even though we want to encourage, not discourage, its supply. Ditto with taxes on capital. Third, we ought to be concerned not only with efficient but also equitable taxation. Thus, it matters greatly upon whom the burden of taxes falls and whether any glaring inequities can be addressed through income transfers or other means. This issue pops up in any discussion of the attractiveness of higher gas taxes.

My point is that we don’t need to guess wildly at externality values. Economists and policy analysts at RFF, universities, and other research organizations work hard to uncover the valuations that people place on environmental and other unpriced consequences, and they make them available to all participants in policy debates. If decisionmakers will listen, and treat these values cautiously, the resulting decisions will be better informed and, for that reason, just plain better.

As you read this, RFF’s 50th anniversary celebration will be days away (October 15th). Let me take this opportunity, then, to thank those of you who have contributed in one way or another to making this milestone possible. Whether by working on the RFF staff, by assigning RFF materials for classroom use, by writing to us with suggestions for improvement or by sending financial support, you have played a role in our success. With a great deal of hard work on our part, and continued help from you, as well, the next 50 years will be even better than the first!
RFF Senior Fellow Kate Probst, lead author of Superfund’s Future: What Will it Cost? (RFF Press, 2001), has been selected to sit on a U.S. Environmental Protection Agency (EPA) Superfund advisory panel charged with making recommendations on how Superfund should address the nation’s most contaminated sites. The panel is tasked with reaching consensus on three major issues: the role of the National Priorities List in cleaning up the worst Superfund sites; the role of Superfund at “mega sites” (where cleanup costs are expected to equal or exceed $50 million); and assessing the success of cleanup programs.

EPA Administrator Christie Todd Whitman announced the formation of the panel in late May. Said Whitman, “Today, Superfund exists alongside other cleanup programs, such as state voluntary cleanups, that did not exist when the [Superfund] statute was created more than 20 years ago. As we move forward as a country on addressing contaminated sites, we need to consider how all these cleanup tools can work together in a more effective and unified fashion.”

Some critics have questioned the Bush administration’s commitment to Superfund, and worry that the panel’s recommendations will be the first step in a dismantling of the program. Others see the panel as a way for EPA to generate some new ideas to make the program more effective. According to Probst, it is too soon to tell what the outcome will be—and much depends on the panel members.

The subcommittee is comprised of a diverse group of individuals with widely varying expertise, representing a broad range of interests. That diversity “may help us come up with some really creative ideas, or it could result in recommendations at the lowest common denominator,” said Probst.

The panel held its first meeting in late June when it began developing an agenda.

PROPOSED REGULATION OF MULTIPLE POLLUTANTS IN ELECTRICITY SECTOR IS HISTORIC: BUT IS IT SENSIBLE?

Spencer Banzhaf, Dallas Burtraw, and Karen Palmer

Twelve years after the passage of the 1990 Clean Air Act Amendments, policymakers in Washington are considering another round of cap-and-trade regulations for the electricity sector that would dramatically reduce emissions of several pollutants from that sector. Two fairly similar proposals are currently in play and both prompt the same question—do the ends justify the means?

Senate Bill 556, introduced by Senator James Jeffords (I-VT), proposes to cap annual emissions of sulfur dioxide (SO₂) and nitrogen oxides (NOₓ) from the electricity sector at about 25% of their 1997 levels (about 2.25 million tons for SO₂ and 1.5 million tons for NOₓ), and annual emissions of mercury at 10% of 1999 levels by 2008 (5 tons). The three are commonly referred to as conventional pollutants.

The Bush administration’s “Clear Skies Initiative” would cap annual allocations of SO₂ emissions allowances at 4.5 million tons in 2010 and at 3 million tons in 2018. Actual emissions, however, would be higher until after 2020 because of the opportunity to carry forward a bank of allowances earned by early reductions under the previous SO₂ program. Annual emissions of NOₓ...
would be capped at 2.1 million tons in 2008 and 1.7 million tons in 2018, and mercury would be capped at 26 tons in 2010 and 15 tons in 2018.

While the Senate and administration proposals differ markedly in timing and somewhat in ultimate goals, the most substantial difference—and the focus of political debate—is the regulation of carbon dioxide. The Jeffords bill would reduce carbon levels in the electricity sector to 1990 levels, while the Clear Skies Initiative proposes voluntary initiatives. Also, the Jeffords bill includes a “birthday provision” requiring that, beginning in 2013, all plants over 40 years old must conform to new source performance standards.

However, for the three conventional pollutants—SO₂, NOₓ, and mercury—the proposals make dramatic commitments to emissions reductions, headed ultimately toward similar emissions goals. And, both proposals apply permit trading as a vehicle to that end. In 1990, trading was controversial when it was adopted for the previous round of SO₂ reductions, today it seems like common sense.

**SIMILAR TRAINS TO THE RIGHT STATION?**

How justified are the large reductions that are included in both the proposals? Has clear thinking been swept away in a race of brinksmanship in environmental protection? Or do the science and economics justify such important federal measures?

We marshaled a suite of models to examine the benefits and costs of the emissions targets set in both policies. We used a detailed simulation model of electricity markets to tally the costs of reducing pollution—including post-combustion controls, switching fuels, and changing the utilization of units.

In another set of models, we mapped the changes in emissions to downwind changes in pollutant concentrations and resulting health benefits from reductions in SO₂ and NOₓ, including the secondary formation of particulate matter. Other benefits such as reduced acidification and formation of ozone are excluded. These models also do not account for interactions with taxes and other regulatory programs that many economists expect to raise the cost of regulatory programs. Nevertheless, if past research is any guide, the model estimates include the lion’s share of actual benefits and costs from reduced emissions.

To assess the caps in these proposals, we compared benefits and costs to find the efficient levels. The efficient level of emissions reductions tends toward the point where the marginal costs of additional compliance equal the marginal benefits. Generally speaking, the most-likely estimate of marginal benefits from SO₂ reductions is in the neighborhood of $3,500 per ton. Very small reductions in aggregate emissions can have various marginal benefits, depending on where they occur. However, marginal benefits remain fairly constant for a modest change in aggregate emissions (say, on the order of about 5%). To the extent that uncertainty can be analyzed explicitly, the uncertainty surrounding this estimate spans a range between $1,800 and $5,200 per ton.

In contrast, the marginal costs of SO₂ reductions increase with the level of reductions. For modest targets, emissions reductions are largely achieved through switching among the types of coal used. For greater reductions, large amounts of post-combustion controls (for example, flue gas desulfurization) must be installed.

In the case of SO₂, the marginal benefits are not offset by marginal costs until annual emissions are reduced to approximately 1 million tons of national SO₂ emissions in the year 2010. The uncertainty introduced on the benefits side would suggest a range

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from under 1 million tons to 3 million tons of SO₂ emissions. By comparison, the Jeffords and Bush administration proposals eventually would limit emissions to about 2.25 million and 3 million tons respectively. Thus, these proposals are at the higher end of the range estimated by the our research, and the most-likely estimate suggests that an efficient target would be even lower than these proposals. In short, the aggressive targets in these proposals appear to be well justified from the perspective of economic efficiency.

According to our findings, the marginal benefits of NOₓ reductions also are relatively flat over the range of reductions contemplated, with a best-estimate value of about $1,100 per ton reduced and a confidence interval ranging from about $700 to $1,600 per ton. Marginal costs are increasing throughout the range and begin to outweigh marginal benefits at about 2.1 million tons—the level proposed by the Bush administration for the year 2008 but higher than the Jeffords cap of 1.5 million tons. Uncertainty inherent in the benefits measures results in an estimated range of efficient emissions levels between 1.0 million tons and 2.7 million tons. Consequently, both proposals are within the range of emissions that can be supported by our analysis.

FIGURE 1

$ BENEFITS PER TON FROM REDUCING ONE TON OF SO₂ IN EACH STATE ($1999)

Source: RFF data

ACCOUNTING FOR REGIONAL VARIATIONS

Although the Jeffords and Bush administration policies are national in scope, as noted above, there can be geographic differences in the benefits of reducing pollution. Figure 1 illustrates the sum of benefits that accrue everywhere in the nation from a reduction of one ton of SO₂ emissions from each state. Emissions in the eastern central part of the nation are the most potent with respect to economic benefits because of the greater population density.

Figure 1 shows the potential usefulness of segregating the emissions allowance trading market into separate regions. If a natural divide separates the relative harm from emissions at different locations, then one would want to design a policy that generated marginal costs at an appropriate scale. A region with high marginal benefits of emissions reductions would justify the high marginal costs associated with a strict target, while other regions might be assigned a more relaxed emissions target. To a small degree, the Jeffords and Bush administration proposals both make an effort to accommodate these differences.
When tradable permits (long studied by staff at RFF) were introduced for SO₂ in 1990, it was a large step toward bringing economic ideas into the design of federal air pollution policy. Regardless of the level of pollution reductions attempted, tradable permits provide a way to achieve that level in the efficient, least-cost way. According to our findings, if either of the leading new proposals becomes law, federal policy may also come closer to achieving the efficient level of reductions in the three conventional pollutants.

Spencer Banzhaf is a fellow and Dallas Burtraw and Karen Palmer are senior fellows at RFF.

PROTECTING U.S. AND E.U. AGRICULTURAL TRADE: AT WHAT COST TO DEVELOPING COUNTRIES?
Thomas Beierle

On November 14, 2001—a day after the scheduled close of the ministerial meeting of the World Trade Organization (WTO) in Doha, Qatar—WTO members emerged from all-night trade negotiations with an agreement to launch a new, comprehensive round of international trade talks. One of the issues keeping negotiators at the table through the night was agricultural trade protection. Now that the 2002 Farm Bill—which, among other things, subsidizes U.S. farmers—is law, questions about the United States’ relationships with its trade partners have hardly been resolved.

Agriculture remains one of the most highly protected arenas of international trade. Import tariffs on agricultural products average 62% across all countries, compared with 4% on industrial goods. Most rich, developed countries further distort trade by giving farmers large subsidies that encourage them to produce more than market conditions would dictate, thereby artificially lowering world prices. Farmers in developing countries have to compete in the same markets with markedly fewer resources. According to the Organisation for Economic Co-operation and Development (OECD), U.S. subsidies increase domestic farm incomes by more than 30% of what they would be at competitive world prices; the European Union increases such incomes by 60%.

One of the principal issues in trade negotiations is the impact of agricultural tariffs and subsidies on the economic growth of the developing countries that make up 80% of the WTO’s membership. Agriculture typically accounts for a much higher share of a developing country’s output, exports, and employment than it does a developed country’s.

According to the U.S. Department of Agriculture, the elimination of agricultural protection around the world would provide annual welfare gains for developing countries of up to $21 billion. Analyses by the World Bank and other institutions predict even greater benefits. Removing trade barriers may also improve food security by enabling developing countries to feed their poor, although the extent to which a trade agreement will do so depends on its specific details.

Reaching agreement in the Doha round will ultimately involve WTO members’ commitments to change protectionist policies at home—a high hurdle for many countries. In the United States, the 2002 Farm Bill would substantially raise exactly the type of subsidies the international talks seek to limit. In Europe, public opinion strongly favors government support of farmers in order to promote a host of social goods, such as environmental protection and rural development.
European fears of voter backlash can claim much of the responsibility for keeping negotiators up all night in Doha. For their part, many developing countries are reluctant to lead the way in promoting agricultural policy reforms because, during the last decade, structural adjustment programs compelled them to unilaterally drop their own protectionist policies; meanwhile, they wait for wealthier countries to reciprocate.

As the Doha round progresses, it is the gulf between these domestic political realities and the demands of trading partners that WTO negotiators will have to narrow in order to reap the gains from trade for the benefit of many.

Thomas Beierle is an RFF fellow.

RFF HONORED AT AERE’S SECOND WORLD CONGRESS

This summer, the Association of Environmental and Resource Economists (AERE) and the European Association of Environmental and Resource Economists (EAERE) hosted their second world congress, which was held in Monterey, CA.

Despite an agenda full of panels and speakers (including many members of the RFF staff), time was made by the congress’ Steering Committee to honor RFF for its “half century of accomplishment.” To this end, the committee gathered signatures from more than 1,000 economists—including, but not limited to, members of AERE and EAERE—endorsing a letter that credited RFF with, among other things, “transforming the landscape of modern resource and environmental economics.” The letter was presented to RFF President Paul Portney.

“Allen Kneese, John Krutilla, and others at RFF, working with a few visionary academic economists, had the foresight to establish the Association of Environmental and Resource Economists,” says Portney. “It is a source of great satisfaction to have seen this association grow to more than 1,000 members and to see the development of sister organizations in both Europe and now Latin America. It is a source of great pride that these distinguished economists chose to honor RFF’s 50th anniversary and to acknowledge RFF’s contribution to the fields of environmental and natural resource economics.”

AERE was founded in 1979 as a forum for exchanging ideas, stimulating research, and promoting graduate training in resource and environmental economics. EAERE was founded in 1990 and works to advance the development and application of environmental and resource economics as a science in Europe; improve communication and contacts between European teachers, researchers, and students of environmental and resource economics; and develop and encourage cooperation between European university-level teaching institutions and research institutions.
Can market-based instruments be effective in a country where monitoring and enforcement systems are still untested and state enterprises are the biggest polluters?

Since spring 2001, the RFF team has been assessing the local situation and, most recently, designing a program for emissions trading among large emitters in Taiyuan, the capital of Shanxi Province. Currently, a formal regulation that would implement the trading system is sitting on the mayor’s desk, awaiting official signatures. Trading is expected to begin in early 2003. How the system will actually work, whether the design will prove viable in Taiyuan, whether tangible environmental improvements can be obtained at reasonable cost, and what modifications might be necessary to improve the system are all unknown at this time. What is known is that there is strong interest in trying to adapt the western-style emissions trading experience to the real-world conditions in China—and a major effort is under way to demonstrate the viability of such an approach.
BACKGROUND

Heavy reliance on relatively uncontrolled coal combustion as a source of heat and power has created serious environmental problems in China—particularly in its coal-rich northern provinces. Particulate matter (PM) and sulfur dioxide (SO₂) are the major pollutants of concern, although with recent progress in reducing PM emissions, attention is increasingly shifting to the control of SO₂. In many urban areas, high SO₂ concentrations—along with fine particles created by the atmospheric transformations of SO₂ into sulfates—represent a serious public health threat.

Situated about 500 kilometers southwest of Beijing, Taiyuan has a population of 2.7 million and covers an area of almost 7,000 square kilometers. Topographically, the city is surrounded by mountains on three sides, resulting in a Los Angeles-type of smog trap in which air pollutants tend to accumulate. A 1998 report by the World Bank identified Taiyuan as among the most polluted cities in the world. SO₂ concentrations—which have been relatively flat over the past decade—averaged 200 parts per million (ppm) in 2000, more than three times the PRC’s Class II annual standard (60 ppm). With recent economic growth averaging 10% per year, the reported absence of deterioration in air quality reflects the considerable effort that has already been devoted to environmental improvement.

In China, local governments generally take their cues for controlling pollution from the central government. Currently, the national control policy relies on emissions standards based on the concentration of SO₂ in the boiler’s stack at a specific point in time. Pollutant concentrations are based on self-reported data from the enterprises and periodic stack testing by the local Environmental Protection Bureaus (EPBs). These estimated concentrations are combined with limited data on pollutant flows to calculate mass emissions from the enterprises. The calculated mass emissions, in turn, form the basis of a small emissions levy ($25/ton), which is used to support local EPB activities with the balance returned to individual enterprises to finance their pollution control investments. It is widely recognized that the current approach to calculating mass emissions is not robust enough to support more aggressive efforts to reduce emissions—including via emissions trading.

A new, more sophisticated mass-based system—“total emissions control” (TEC)—is being implemented in China as a supplement to the existing stack-gas concentration standards. The TEC system is similar in many ways to individual facility-level caps on SO₂ emissions imposed under Title IV of the U.S. Clean Air Act. Once it is fully implemented and enforced, the mass-based TEC system will be able to serve as a key building block of an emissions trading system.

China typically experiments with new pollution control programs through pilots or demonstrations. The Taiyuan city government began experimenting with emissions permits and earlier pilot versions of the TEC system in the 1980s. As early as 1985, emissions controls were introduced in local regulations issued by the Taiyuan government. The city conducted experiments with emissions offsets and (administratively determined) trading in the mid-1990s. In 1998, the Taiyuan city government issued TEC “management rules,” including a provision for “permit exchange,” a form of emissions permit trading. The Taiyuan EPB has begun to issue updated permits with TEC-based limits to large enterprises. So far, more than three dozen permits have been issued—all of them to large enterprises. Although widely seen as extremely ambitious, the Tenth Five-Year Plan for Taiyuan calls for 2005 SO₂ emissions to be reduced to about 50% of 2000 levels.
KEY QUESTIONS FOR USING MBIs IN TAIYUAN

Since early 2001, members of the RFF team have made almost a dozen trips to Taiyuan to collect data and work with local officials and enterprise managers on design issues. Several critical questions need to be considered at the outset:

Do market-based instruments really have the potential to reduce environmental control costs in Taiyuan?

The RFF team conducted an assessment of expected SO$_2$ control costs for different enterprises in the city. The marginal costs of abatement, as shown in the accompanying table, suggest reasons for at least a prima facie case for MBIs. Estimates of these costs range from $60–$1,160 per ton of SO$_2$. In a western context, this wide range of abatement costs would certainly provide an incentive for both government and industry to look favorably on MBIs. The alternative—a traditional command-and-control approach—would likely force some firms to undertake unnecessarily expensive mitigation options to achieve the same emissions reductions available at lower cost.

If conditions are ripe for MBIs, why not simply increase the existing pollution levy?

The current levy is clearly not high enough to create incentives to change behavior. Therefore, substantially increasing the levy, as was recently done in Beijing, is a potential option. After extensive discussions with provincial and local officials, however, it became clear that reforming the current levy while simultaneously increasing the rate to create significant new abatement incentives would not be politically acceptable in Taiyuan. Introducing an MBI in the context of the newly established TEC was seen as being more acceptable, especially to the enterprises, which feared the imposition of higher taxes in the form of levies.

Could an emissions trading program survive in a place that historically lacks strong enforcement and compliance systems?

Our purpose is to translate the international experience with emissions trading to the real-world conditions in Taiyuan, a resolve that required us to consider China’s unique historical, institutional, and technological context. Emissions trading works in the United States and elsewhere when certain conditions—often the same conditions necessary to support traditional methods of environmental control—are present. But Chinese environmental institutions are still in their infancy in the development of their compliance and enforcement systems. Why try to save money on regulation if you aren’t expending any to begin with or if the system is so riddled with exceptions that enforcement is not sure?

The courts generally cannot be relied on for an independent source of compliance oversight, as judges owe their appointments, salaries, and social benefits to the provincial and local governments, the same institutions that own and control most heavy industry and pay the salaries of the local EPB officials. Similarly, the penalties for violating pollution standards are inadequate to support an enhanced environmental management system of any type (see below).

Is the current monitoring system suitable for emissions trading?

The dearth of experience with consistent monitoring raises questions about whether the appropriate incentives exist for industry to participate in a trading program. Whatever environmental management system is ultimately adopted in Taiyuan, the basic tracking, recordkeeping, and enforcement functions will need extensive upgrading and renewed compliance commitments. The monitoring system is a case in
DEMONSTRATING EMISSIONS TRADING IN TAIYUAN, CHINA

point: continuous emissions monitors (CEMs) of the type used in the U.S. acid rain program are currently installed in only a handful of units in Taiyuan. Although there are ambitious plans to add several hundred more CEMs by the end of 2002, there have already been significant delays. Thus, alternative and generally less accurate methods of estimating emissions will be necessary during the demonstration.

If emissions trading is to be introduced in Taiyuan, which sources would participate in the program and how would the permits be allocated?

The obvious choice is to expand the ongoing efforts to introduce the TEC mass-based permit system among large emitters. The possibility of allocating permits via auction was discussed early on but it was clear that existing financial and political constraints would stymie such an effort. However, the proposed regulation does allow the city government to retain a small portion of the permits to be auctioned to the highest bidder.

To improve the local capacity to manage the demonstration program, the U.S. Environmental Protection Agency (US EPA), which has extensive experience in developing and managing trading programs, has helped provide training under a parallel agreement with the Asian Development Bank. To date, the training has focused on the technical aspects of MBIs, U.S. and other international experiences with emissions trading, design elements of a trading program, measurement, emissions and allowance tracking, and emissions verification. In addition, the RFF team has formed a highly successful alliance with the Chinese Research Academy of Environmental Sciences, which has provided technical assistance on a wide range of issues.

THE CURRENT SITUATION

Twenty-six of the largest enterprises—representing about half the reported emissions in Taiyuan—are slated to participate in the new trading system. Apart from a few small adjustments to reflect recent investments and expansions, the baseline for individual enterprises is the actual reported SO$_2$ emissions in 2000 – 2001. Although discussions are still continuing on this point, the 50% reduction mandated in the Tenth Five-Year Plan is reflected in the 2005 initial permit allocations slated for individual enterprises. Targets for interim years also have been established. New sources may purchase permits from existing sources or from the small set-aside held by the local EPB. Banking of permits is allowed.

The largest sources are required to install CEMs. For others, a new emissions tracking system has been developed to integrate into a single data system all the relevant information reported by the government as well as by the enterprises concerning emissions, fuel purchases (including sulfur content), output, and other factors. A parallel allowance-tracking system has also been developed by the US EPA to monitor actual trades. It is anticipated that the operation of both the emissions and the allowance-tracking systems, in combination with the available CEMs, will provide a credible basis for emissions trading.

Establishing the appropriate penalty for violations is an issue that still must be resolved. Based on international experience, it is clear that the penalty for exceeding permitted emissions must be high enough to ensure that sources have adequate incentives to either control their emissions within permitted levels or to trade with other sources in order to satisfy their obligations. However, pursuant to a regulation previously issued by the provincial government, the maximum penalty the local EPB can impose on a sin-
gle enterprise is less than $4,000 per violation. Discussions are still continuing on how to interpret the notion of an “individual violation,” for example, whether to calculate on a per-year or a per-ton basis, or whether the provincial regulation itself must be revised. The outcome of these discussions will be an important bellwether of the commitment of both the local and provincial governments to an enhanced environmental management regime via MBIs or any other approach.

Once the regulation is formally adopted, implementation will get under way. Further training on data reporting, emissions and allowance tracking, and other topics will be conducted later this year. Actual trading is expected to begin in spring 2003. The RFF team will continue to provide technical assistance to both the enterprises and the local officials, and will also conduct an evaluation of the program later in the year. Revisions to the program will be recommended as they are identified. Depending on the results of the demonstration, officials may try to expand the Taiyuan emissions trading system to other cities in the province and beyond.

Overall, there is widespread interest, among both the Chinese and the international community, in the SO2 trading demonstration project in Taiyuan. Although the operational success of the demonstration is still unknown, the prospect of a regulation being formally issued by the city government is a major milestone. Regardless of the ultimate outcome, important lessons will be learned about the suitability of MBIs for developing countries, particularly for planned-market systems such as the People’s Republic of China. Further, the city of Taiyuan will have in place a much-improved system for administering whatever type of regulatory system it ultimately implements.

Richard Morgenstern and Alan Krupnick are senior fellows at RFF. Ruth Greenspan Bell is a visiting fellow at RFF, and Xuehua Zhang, a research assistant. Robert Anderson is a private consultant.

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**Table 1**

**COST-EFFECTIVENESS OF SO2 CONTROL MEASURES IN TAIYUAN**

<table>
<thead>
<tr>
<th>Control Measure</th>
<th>Where Applied</th>
<th>$/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat post-combustion gas</td>
<td>Taiyuan District Heating</td>
<td>($60)*</td>
</tr>
<tr>
<td>Flue Gas Desulfurization (FGD)</td>
<td>Eastern Mountain Plant</td>
<td>($80)</td>
</tr>
<tr>
<td>Lower sulfur coal (~1.3%)</td>
<td>Taiyuan #1 &amp; #2, Taiyuan Iron &amp; Steel</td>
<td>($100)</td>
</tr>
<tr>
<td>FG D (simplified)</td>
<td>Taiyuan #1</td>
<td>($240)**</td>
</tr>
<tr>
<td>FG D</td>
<td>Taiyuan #1 (Planned)</td>
<td>($180)*</td>
</tr>
<tr>
<td>Add limestone to fuel</td>
<td>Coal gasification plant (Planned)</td>
<td>($130)</td>
</tr>
<tr>
<td>Coal washing</td>
<td>Future Sites (Possible)</td>
<td>($1,160)</td>
</tr>
</tbody>
</table>

* as reported by plant officials to RFF team, March 2001.
** plus unspecified investment costs paid for by the government of Japan.

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**Fore More Information**


Thirteen global environmental treaties have gone into force in the last three decades, but the United States is party to only half of them. The Senate’s great reluctance to ratify loosely worded treaties, such as the Kyoto Protocol, has meant the United States has no role in their implementation.

While the United States’ refusal to ratify the Kyoto Protocol took the rest of the world by surprise, it was part of a wider pattern. If Kyoto goes into effect later this year, as its supporters hope, it will be the fourth worldwide environmental treaty in the past decade that the United States has refused to join.

The United States is likely to find itself on the defensive at the United Nations World Summit on Sustainable Development in Johannesburg, South Africa. It will be assailed as the great example of a powerful country that has declined to take part in a dramatic expansion of international environmental law—a country that insists on making its own rules, rather than joining a worldwide effort for the common good.

The United States failed to join those four treaties because of the specific political disputes that they generated (see Table 1 for a list of all the treaties currently in effect or pending). The American constitutional requirement of a two-thirds vote to ratify in the Senate always gives the advantage to treaty opponents.

But underlying these political quarrels is a collision over legal standards that has become more visible over time.
The United Nations, under which these treaties were drafted, has developed a negotiating process that proceeds by consensus rather than by divisive up-or-down votes. Maintaining consensus in an organization with 189 members generates great pressure to paper over difficult issues and to set aside awkward details. In particular, it creates a strong incentive not to insist on rigorous procedures for verification and enforcement. The U.N. environmental tradition is based on a belief that it’s better to agree on a loosely worded text and trust to governments’ good faith, than to press for tight legal language that risks sinking the whole enterprise.

Treaties negotiated in that spirit then get sent to the respective governments for ratification. In most parliamentary democracies, the government has absolute control over ratification. But in the United States the president must submit the treaty to the Senate, where the standards for ratification have been hammered out in fierce struggles over trade and, especially, arms control, subjects in which clarity in the details is essential and enforcement is everything. In that atmosphere, a treaty like Kyoto—which would impose significant economic costs on the United States but contains no credible sanctions against other countries’ failures to meet their commitments—has little chance for ratification. Woe to the unfortunate assistant secretary of State who is sent up to Capitol Hill to try to persuade the Foreign Relations Committee to vote for a treaty the enforcement of which depends essentially on the goodwill of this country’s competitors and adversaries.

**THE SENATE’S ROLE**

Many American politicians also believe that the nature of the legal system in this country would force the U.S. government to live up to its treaty commitments more rigorously than other countries might. Upon ratification a treaty becomes U.S. law, and the American courts have permitted environmental organizations to bring suits demanding strict enforcement of law. In most other countries, courts are much less willing to give citizens standing to sue their government. Policymakers here fear that the courts will hold them to strict adherence to a treaty’s requirements, while other countries could fall short with impunity.

But American abstention from these new environmental treaties can create legal anomalies affecting substantial American economic interests. For example, negotiations over rules for trade in genetically modified foodstuffs have been proceeding under the Convention on Biological Diversity, which took force in 1993. The United States is the largest exporter of genetically modified agricultural products, but since it has never signed on to this treaty, it attends these negotiations as an outsider with, legally, no seat at the table.


In the 1990s, the United States ratified only two global environmental treaties. The Senate voted to join the Framework Convention on Climate change in 1992 after the first Bush administration assured the senators that there was nothing in the treaty that could actually require any change in American policy or habits regarding greenhouse gas emissions and the use of energy. (Negotiators drafted the Kyoto Protocol in 1997 after it had become clear that the unenforceable exhortations in the Framework Convention were having no effect. The purpose of Kyoto is to impose explicit and binding limits on the greenhouse emissions of the industrial countries.)

The United States also ratified the Convention to Combat Desertification, which went into effect in 1996. This treaty pertains primarily to Africa.
The United States has ratified only one family of global environmental treaties that impose serious restrictions. It joined the Montreal Protocol of 1988 and its subsequent amendments, which required reductions and ultimately a ban on a class of gases that were eroding the stratospheric ozone layer. The ozone layer protects the Earth from solar radiation that can cause skin cancers. The treaty was pushed rapidly through the Senate by the public fear of cancer, and by the chemical industry’s success in rapidly developing substitutes for the harmful gases.

Environmental diplomats around the world considered the Montreal Protocol to be the model for international action, and used it as their template in drafting the Kyoto Protocol. They failed to perceive the enormous differences in the politics of the two treaties, however. Unlike Montreal, Kyoto addressed no urgent and widely understood health threat. Nor could the threat be met by a quick technical solution. Instead, in the United States, Kyoto became entangled in controversy over its costs and the defects in the treaty itself.

DEVELOPING COUNTRIES’ SUSPICIONS

The Johannesburg summit is likely to demonstrate that its tradition of loosely written and loosely enforced environmental agreements has costs that are not limited to the United States. One abiding reality of world environmental politics is the deep suspicion among developing countries that these agreements are merely devices to suppress their economic growth, engineered by the rich countries to prevent the emergence of competitors. That is why, for example, the Kyoto Protocol’s limits on greenhouse gas emissions apply only to the industrial countries, not to the developing countries.

In repeated attempts to allay these suspicions, the rich countries have made large promises to help the poor ones in many ways. But, again, there has been little in the way of enforcement and many of the promises have remained unfulfilled. That, in turn, has reinforced the suspicions and the inclination not to cooperate.

At Johannesburg, the World Summit on Sustainable Development will be different from its predecessors. Its main business will not be to set new goals, but rather to try to find ways to make visible progress toward all the goals set by similar meetings in the past.

The phrase “sustainable development” has an instructive history. It originally was used to mean simply that one generation has an obligation not to use resources in ways that would degrade the lives of future generations. But that hit a nerve, since one obvious way to save resources is to slow the industrialization of developing countries. The architects of sustainable development immediately agreed that the term had to include economic growth. If it included economic growth, sustainable development also had to mean better education and health care. It had to mean access for poor countries’ exports in rich countries’ markets. It had to mean aid, both financial and technical.

As this conversation went on, the definition of sustainable development came to cover the whole agenda for worldwide social equity. It was codified in a book-length document, Agenda 21, and adopted with great applause at the U.N. Conference on Environment and Development (UNCED) in Rio de Janeiro 10 years ago.

In preparation for the Johannesburg meeting, U.N. Secretary General Kofi Annan submitted a report last December taking stock of developments under Agenda 21.
“...[P]rogress towards the goals established at UNCED have been slower than anticipated, and in some respects conditions are actually worse than they were 10 years ago,” the report said.

“Second, no major changes have occurred since UNCED in the unsustainable patterns of consumption and production which are putting the natural life-support system at peril...

“Third, there is a lack of mutually coherent policies or approaches in the areas of finance, trade, investment, technology and sustainable development...

“Fourth, the financial resources required for implementing Agenda 21 have not been forthcoming and mechanisms for the transfer of technology have not improved.”

One reason for nonperformance under Agenda 21 and similar agreements is that U.N. environmental meetings tend to be attended by the respective governments’ ministers of the environment who, in the company of kindred spirits, make ambitious declarations that they then carry home and turn over to the finance ministers, on whose desks they gather dust.

## TABLE 1 - MAJOR WORLDWIDE ENVIRONMENTAL TREATIES SINCE 1975

<table>
<thead>
<tr>
<th>Treaty</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonn Convention on Conservation of Migratory Species, in force since 1983.</td>
<td>The U.S. is not a party.</td>
</tr>
<tr>
<td>Montreal Protocol to the Vienna Convention, in force since 1989. This protocol set the first explicit limits to emissions of gases that erode the ozone layer.</td>
<td>The U.S. is a party.</td>
</tr>
<tr>
<td>Basel Convention on Transboundary Movements of Hazardous Wastes and Their Disposal, in force since 1992. This convention was a response to the growing practice of dumping wastes in developing countries and Eastern Europe.</td>
<td>The U.S. is a party.</td>
</tr>
<tr>
<td>Convention on Biological Diversity, in force since 1993.</td>
<td>The U.S. is not a party.</td>
</tr>
<tr>
<td>Framework Convention on Climate Change, in force since 1994.</td>
<td>The U.S. is a party.</td>
</tr>
<tr>
<td>Convention to Combat Desertification, in force since 1996.</td>
<td>The U.S. is a party.</td>
</tr>
<tr>
<td>Kyoto Protocol to the Framework Convention. The negotiators adopted the text in 1997, but it has not yet collected enough ratifications to go into force. Supporters hope that will happen later this year.</td>
<td>The U.S. has said that it will not ratify.</td>
</tr>
<tr>
<td>Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. The text was adopted in 1998, but is not yet in force.</td>
<td>The U.S. has not ratified.</td>
</tr>
<tr>
<td>Stockholm Convention on Persistent Organic Pollutants. The text was adopted in 2001, but it is not yet in force.</td>
<td>The U.S. has not ratified.</td>
</tr>
</tbody>
</table>
In an attempt to address this resistance directly, the United Nations called a meeting last March in Monterrey, Mexico, summoning the finance ministers and their bosses to discuss development aid.

President Bush attended, delivering a notable address in which he said that the United States would increase development assistance by half over the next three years, an increase of $5 billion a year over the current level. That would be a highly significant jump in American aid. But the total would still be less than one-fourth the United Nations’ longstanding goal of 0.7% of each donor country’s gross national product.

Development assistance worldwide is small compared to private investment, Bush observed, and investment in turn is small compared to the flows of trade. “So to be serious about fighting poverty,” the president said, “we must be serious about trade.”

Like Agenda 21, the Bush administration is strongly in favor of open markets. But its recent restrictions on steel imports were a harsh signal that its tolerance for politically painful imports is low. Even more recently, a large bipartisan majority swept through Congress a huge expansion of agricultural subsidies, which will depress prices for farmers in other countries. The American enthusiasm for farm subsidies is exceeded only in the European Union, which is now trying to find a way to reconcile admission of Eastern European countries with the preservation of its aggressively protectionist agricultural rules.

On this subject, Agenda 21 called it “essential” that there be “substantial and progressive reduction in the support and protection of agriculture—covering internal regimes, market access and export subsidies—... in order to avoid inflicting large losses on the more efficient producers, especially in developing countries.”

U.N. environmental politics has two sides—a spirit of high idealism but a record of unfulfilled promises and agreements weak on enforcement. Agenda 21 and the Kyoto Protocol reflect both sides. As time goes on, the lack of follow-through is alienating both the richest and the poorest of the U.N.’s members. Johannesburg is the place where the United Nations will ask the world’s governments whether they want to do anything about that.

J.W. Anderson is journalist in residence at RFF.

For More Information:


Editor’s Note: This article, and the one on the next page, were prepared prior to the summit.
At the World Summit on Sustainable Development, held in Johannesburg, South Africa, governments, international institutions, and members of the private sector and civil society will meet to review the 10 years since the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992. Out of UNCED came Agenda 21, an extremely detailed and ambitious action plan for promoting various facets of sustainable development; several specific international agreements, including treaties on climate change and biodiversity; and the U.N. Commission on Sustainable Development, charged with following up on the UNCED objectives.

Progress on giving operational meaning to the principle of sustainable development and accomplishing the lofty goals of the Rio Summit can only be described as mixed. Poverty has fallen in some places, while others have barely kept pace and still others have retrogressed. Some societies are freer and more open today, with stronger institutions of civil society; others are not. And with respect to natural resources and the environment, the main focus of work at RFF, many challenges remain.

Many, many millions of people continue to suffer from water shortages and water contamination, polluted indoor air or urban airsheds, challenges in meeting food needs, and access to reliable, affordable energy. Internationally, the community of nations still struggles with effective means to address protection of biodiversity, marine fish stocks, and the climate system while also achieving progress in living standards through resource development and energy use. New questions have arisen as well, especially concerning trade and the environment and problems related to disease and pest resistance.

Participants at the summit will seek to take stock of what has been accomplished since Rio 1992, what lessons have been learned about the effectiveness of different approaches, and what might be done to strengthen progress toward sustainable development.

RFF has long played a part in international discussions about sustainable development. RFF Board Member Maurice Strong was the secretary general of the 1972 United Nations Conference on the Human Environment, held in Stockholm, Sweden, which was the predecessor to the Rio conference. And the late RFF Senior Fellow Hans Landsberg served as his advisor. This year, RFF Senior Fellow Richard Morgenstern will be co-chairing a workshop in Johannesburg on environment and development and will present a paper on the RFF project on SO$_2$ trading in Taiyuan, China.

In advance of the Johannesburg summit, a number of experts at RFF and invited participants from other research institutions have come together to produce a series of Issue Briefs on natural resources, the environment and sustainable development, available on our website at www.rff.org/Johannesburg/Johannesburg.htm.

Our goal in putting together this series of papers is to make available to as broad an audience as possible the fruits of analysis at RFF and elsewhere on how progress toward sustainable development might be made. Knowledge is power; we hope the facts and insights provided by these papers are useful not just in the deliberations at the summit but afterwards, when the hard work to change unproductive policies and practices must be tackled. Comments on the papers are welcome and can be addressed to me by email (toman@rff.org).
produc ing oil or reducing oil:
Which is Better for U.S. Energy Security?
Heather L. Ross

When it comes to lowering the risk of an energy shock to our economy, measures to reduce domestic oil demand outperform measures to increase domestic oil supply.

Energy security has achieved new prominence in the debate over U.S. energy policy. While oil markets of the last decade have remained relatively stable and oil relatively cheap, compared with the oil shock period of the 1970s and early 1980s, security concerns have risen as U.S. oil demand and import reliance have increased while threats of terrorism and Middle-East hostilities have heightened. In June 2001, President Bush sent to Congress a package of proposals developed by a White House task force, the National Energy Policy Development Group, which invoked national security as a major objective. A House bill passed in August 2001 largely adopted this package, including a measure opening the Arctic National Wildlife Refuge (ANWR) to oil drilling.

The Senate, acting in early 2002, rejected ANWR drilling and also voted down raising the Corporate Average Fuel Economy (CAFE) standards. These two proposals—ANWR, the flagship of supply increase measures, and CAFE, the leading demand reduction policy—have dominated public discussion of the pending legislation, which is currently awaiting conference committee reconciliation.

The idea that adding reliable oil supplies is the right way to enhance energy security is understandable—it satisfies our intuition that substituting safe oil for risky oil will make us safer, and it worked on a global scale to help end the oil shocks in the 1980s. But the fact that we have been reducing our demand for oil as a share of the economy for the past 25 years has actually been
the key to increasing U.S. energy security over that period, and demand reductions will continue to offer the best hope for a secure energy future.

Oil security is a function of two factors—the likelihood of a supply disruption and the impact of a disruption if it occurs. U.S. policies that increase domestic supply or decrease domestic demand by the same amount will have the same effect on the likelihood of disruption, because they will back the same amount of imports out of the U.S. market. They will therefore have the same net effect on the global oil market and its participants. But demand reductions, because they reduce the relative importance of oil in the economy, will decrease the impact of any disruption, while supply increases, which replace imported oil with domestic oil but do not alter the oil intensity of the economy, will not.

The United States has in fact been following the path of lowering oil intensity—oil consumption per dollar of gross domestic product (GDP)—since the late 1970s. Figures 1 and 2 show the historical trends in U.S. oil usage and intensity. Figure 1 shows the persistent rise of U.S. oil consumption and oil imports over the past 20 years, a period when domestic production drifted downward. Our imports are now above their 1970s oil-shock peak and, for the first time in history, exceed our own production. Advocates use these facts to argue for increased domestic production in the name of energy security. Figure 2 shows the more pertinent picture. Our vulnerability to oil disruption has been declining throughout this period because oil has come to play a smaller and smaller role in our economy. Oil disruptions are now less harmful to us than they have ever been, because our oil intensity is at a historic low and leverage of the remaining uses of oil on the GDP has not increased enough to offset this effect.

It is reductions in oil demand per dollar of GDP, achieved through policy and market responses, that have gotten us to this point. What, then, do supply-side policies have to offer? With no contribution in terms of lowering the impact of disruption, their only possible merit is if they can displace enough imports to materially reduce the likelihood of disruption, and do so more cheaply than demand-side policies can.

Pursuing this solution on a world scale makes sense—new non-OPEC (Organization of Petroleum Exporting Countries) supplies developed in the 1980s helped bring the original oil shock period to a close, and prospects are promising now for substantial additional production.

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1 Note that domestic production, if it completely replaced imports, would lower the impact of disruption, but this is unattainable. As long as we participate in the world market, a disruption originating anywhere in that market will have the same effect on us regardless of the share of our consumption that is imported, because it will cause a repricing of all our consumption, not just our imports. A lower share of imports will reduce the terms-of-trade disadvantage from sending oil payments overseas, but this is not directly a security consideration, and the indirect effect on security could be negative if lower OPEC revenues had a destabilizing effect on some member countries.
supplies from newly developing areas in the former Soviet Union and Africa. The United States does not offer many such prospects, however, as our low-cost deposits have been mostly discovered and extracted. A look at Figure 1 shows that U.S. oil production remained flat during the 1980s when production expanded elsewhere in response to OPEC price escalation. Our lack of expansion in the face of a six-fold increase in oil prices, although U.S. prices were initially constrained by price controls, is powerful evidence of the steep slope of our remaining domestic oil supply curve. The cost to us of displacing enough imports to remotely affect the stability of the world oil market is prohibitive.

But what about making our marginal contribution to the multilateral mission of reliable oil supplies, and thereby doing our part to reduce the likelihood of disruption? We do this every day as we produce oil within the larger global market to which we belong. The question is whether we can take steps to expand our marginal contribution, and the answer is certainly yes. The United States has been a leader in new exploration and production technology that has greatly lowered the supply cost curve here and around the world, and those technical advances are continuing.

There is less to be said for two other aspects of cost reduction, both of which figure in the current energy bills. The first is new financial breaks for oil companies, in the form of special tax preferences and lease terms. Given the steepness of our oil supply curve, this favored treatment, while reducing tax equity, does a lot more to increase the profitability of production than it does to add to production. Also in play are efforts to reduce environmental costs, including rollbacks in operating requirements and access restrictions. Here, oil interests and others with a stake in oil activity are working against the tide, as people over time have come to understand better and value more the amenities of a clean and natural environment.

The judgment of how and where oil operations can proceed at net social benefit—that is, after mitigating the nonmarket costs of environmental harm and offsetting the value of any unmitigated environmental costs that remain—must be made in the public domain, based on the intangible environmental values held by citizens. In the case of ANWR, given the information that is currently available about oil prospects there, mitigation measures for oil development, and potential harm to Arctic flora, fauna, and wilderness character, the implied estimate of those intangible environmental values can only be described as enormous. It is probably not surprising to see that valuation tested in Congress, although it will probably not result in legislation opening ANWR this time around. In future attempts that will surely come, the proper question will be whether the public’s net benefit calculation for development has turned positive, and although untoward events can trigger unfortunate reactions, the truth is that energy security has very little bearing on that calculation.
Our principal policy response to the first oil crisis was on the demand side—notably energy efficiency, including vehicle fuel economy—and the effects of that intervention are still apparent. A committee convened last year by the National Research Council, the study arm of the National Academy of Sciences, estimated that reduced gasoline demand stemming from that earlier era’s CAFE standards plus price-induced conservation was, by the year 2000, reducing U.S. oil consumption by 2.8 million barrels per day, or 14% of total usage. When it comes to staying power, there is quite a contrast between temporary supply increases from limited-lifetime wells extracting a nonrenewable resource from a highly depleted base and enduring demand reductions based on oil efficiency improvements and alternative fuels substitution permanently weaning the economy off oil. And while some near-term supply increases can compete with some near-term demand reductions in terms of cost, policy interventions at the scale and duration needed to make a material difference in oil security will come cheaper on the demand side.

In sum, demand reductions outperform supply increases because every barrel of oil we take or keep out of the economy reduces the harm of disruption, and demand reductions can proceed at a greater scale, longer life, and lower cost than supply increases, thereby diminishing the likelihood of disruption more effectively. Deciding to intervene in the oil market for energy security purposes requires careful thought, but if we are thinking of going down that path, our thoughts should turn to reducing oil, not producing oil.

Heather L. Ross is a visiting scholar at RFF.

For More Information:


2 Work was also begun on the Strategic Petroleum Reserve, an important stop-gap source of oil in the event of disruption.

It’s a safe bet that the average American pays scant attention to the natural environment in Russia, or to the institutions that watch over it. The country has remained “a riddle, wrapped in a mystery, inside an enigma” long after Winston Churchill characterized it as such at the outbreak of World War II. Even though time has pulled back the Iron Curtain, Russia remains largely out of mind. Western press coverage typically focuses on more newsworthy items than the environment, such as the recent tit-for-tat trade battle over American chickens and Russian steel and Russia’s dissatisfaction with its performance in the Winter 2002 Olympics.

However, the state of the environment in Russia matters a great deal. Russia is the largest country on earth, accounting for more than 10% of the world’s total land area, and is richly endowed with energy, mineral, water, and forest resources. Consequently, it attracts attention from both those hoping to exploit this bonanza and those wanting to conserve nature. On the climate change front, Russia is the second or third largest emitter of greenhouse gases, although it also is a large potential long-term carbon sink because of its vast forest reserves. Add to this the legacy of cross-border contamination from the Chernobyl accident in the...
Ukraine, plans to earn hard currency by importing nuclear waste from other countries (which will add to wastes from the military complex and the country’s own 30 operating commercial reactors), and an abundance of pollution from what are now outdated industrial enterprises that lack funds to clean up, and it’s clear that there is much to worry about.

How to eliminate existing messes and prevent future ones has roused the environmental community. Since the early 1990s, western institutions have provided more than $1 billion of environmental assistance for equipment, training, development of nongovernmental organizations (NGOs), and technical analyses. Russia’s own environmental institutions, although frequently marginalized, buffeted by restructuring, and starved for funding, have managed to mitigate some of the worst environmental excesses. And Russia, without hyperbole, continues to be a world leader in many scientific and technical areas. Even with the ongoing “brain drain,” it remains chock-full of experts who can design methods to remediate contamination, devise technologies to reduce emissions, and create clever economic instruments to encourage more environment-friendly behavior.

**COMPICATING FACTORS**

All of these virtues, however, are not enough to make environmental protection all that easy; several factors complicate matters.

First, the vastness of Russia makes the monitoring of polluting enterprises difficult. The sophisticated network of the national hydrometeorological and environmental monitoring system, which is set up primarily to monitor ambient environmental conditions and to forecast trends, is not well-suited for detecting site-specific discharge violations. Moreover, it is stretched thin—across the country as a whole, each station in the water quality monitoring network covers, on average, a 10,000-square-kilometer area, one and a half times the size of Delaware.

Second, dwindling public funding has decimated environmental protection activities. The Russian economy was in a nosedive through most of the 1990s, with real gross domestic consumption per capita falling by 40%, and federal outlays for environmental protection plummeted. Reports from the field suggest that fewer than 40% of the laboratories that analyze water quality chemistry remain certified, for example, and all are suffering from inadequate staff training, obsolete equipment, and poor maintenance.

Third, a quick glance at a map highlights the extreme natural conditions that complicate environmental protection efforts. In the vast oil and gas region of western Siberia, for example, oil pipelines regularly spring leaks due to the cold weather and insufficient maintenance. More than 90% of the volume of liquids extracted from many oil wells in the Nizhnevartovsk area along the Ob River is water, contributing to the frequency of pipeline freezing. Roughly 25% of the area’s 11,000 kilometers of field pipelines need to be replaced annually, yet many smaller local producers lack the revenues to maintain their pipeline structure.

**RUSSIA’S ‘VIRTUAL ECONOMY’**

Two economists, Cliff Gaddy and Barry Ickes, argue that much of Russia has a virtual economy rather than a real one; many enterprises don’t behave according to our conventional models of economic behavior and, rather than seek to maximize efficiency and profit, they invest in relationships. They barter with other enterprises, negotiate with or bribe authorities to get favorable tax treatment, and provide services to local communities where they still have tight social obligations. In such a setting, corruption is rampant.
WHO IS PROTECTING RUSSIA’S NATURAL RESOURCES?

This “virtual economy” is not merely an abstract picture of a past reality. In March, the governor of the Kursk region in western Russia signed an agreement with one of Russia’s largest private oil companies that will allow the company an 80% share of the region’s gasoline market. The government will provide land for the company to construct oil storage facilities, gas stations, employee housing, and social centers, while the company promises to participate in local agricultural, industrial, housing, and social programs, as well as help develop the local energy industry.

But there are equally deep problems outside the well-known failures of competitive markets and corruption. The limited rule of law in Russia hampers the implementation and enforcement of all laws, including environmental ones. The country has a history of writing laws for their “aspirational” value rather than with the expectation that the laws will be observed. Given this history, it is not surprising that nearly 60% of Russian, central and eastern European, and international economic experts informally polled during the 2000 presidential campaign in Russia ranked “establishing a rule of law” as the most important area that the new president should focus on.

More specific to the environment, a survey of NGOs at the 1999 All-Russia Congress on Nature Protection revealed that two thirds of respondents believe that improving legislation is one of the three top priorities for improving environmental policies (see Table 1). Yet, only one third identified actual enforcement of legislation and regulations as a top three priority, an example of the “aspirational” character of the legislative agenda.

NEED FOR CIVIL SOCIETY

With a widely recognized breakdown in the rule of law and limited forces to resist the power of the state and quasi-state interests, there is a clearly acknowledged need for the development of a “civil society” in Russia. In broad terms, this concept refers to a web of self-organized, pluralistic independent institutions that can serve as a counterpoint to the traditional power of the state. Decisions would be based on a rule of law and rest on a respect for and protection of individual rights and freedoms and participation in civic affairs. This sounds all well and good but is it realistic? Can processes be developed to promote a civil society, with a web of individuals and institutions working to bring disparate values and ideas into public discourse?

First, the pessimistic view. For starters, it appears that much of the Russian public is reluctant to help further a civil society. A poll last summer of 1,500 residents indicates that only 5% of Russians currently participate in public organizations, and nearly 75% say they have no interest in doing so. This may result from a legacy of distrusting institutional agendas for change.

| Percentage of Respondents Who Rank Factor As One of the Three Top Priorities |
|-----------------|---|
| improved legislation | 66 |
| increased education | 52 |
| increased public involvement | 41 |
| increased use of market incentives | 34 |
| improved enforcement | 34 |
| increased penalties | 24 |
| increased use of science | 22 |
| higher funding | 7 |

Source: Original data collected by author in 1999. For further details, see RFF Discussion Paper 02-04, listed in “For More Information.”
WHO IS PROTECTING RUSSIA’S NATURAL RESOURCES?

In addition, although citizens have the right to participate in public decisionmaking—a right that is embedded in the Russia constitution as well as specific environmental legislation such as the Law on Environmental Protection—opportunities for genuine exchange of ideas in the public sphere with businesses, local governments, and other interested parties are still very limited in many regions of the country.

Moreover, many of the environmental NGOs in Russia appear to work only intermittently with local stakeholders. Forty percent of respondents to the 1999 NGO survey reported they only “occasionally or never” work with the public (see Table 2), for example. More striking, more than 40% of respondents also only “occasionally or never” work with local elected officials and local governments. Russian sociologist Maria Tysiachniouk and ecologist Alexander Karpov have written of the low value many NGOs place on experiential evidence contributed by local citizens in NGO decisionmaking, and the heavy emphasis placed on and the necessity for professionalism and scientific approval.

But one can also find grounds for hope for a Russian civil society. Numerous grassroots efforts in Russia have taught the public about environmental policy and protection in the last decade. Many of these efforts have focused on problems that stir local passions, including protection of rural land, children’s health, and economic livelihoods. Notwithstanding the apparently limited experiences with involving the public, Table 1 shows that increasing public involvement is one of the top priorities for improving environmental policies for many NGOs. Russian environmental NGOs also have stressed education in their activities—as witnessed by the high proportion of NGOs that work with educators—and this has helped to improve the public’s understanding of environmental problems.

Furthermore, when asked what factors are important to consider when taking an action to protect the environment, many NGOs, not surprisingly, highly value legal requirements and scientific justification, but involving the public also warrants considerable support (see Table 3). Including a broad group of stakeholders in decisionmaking is viewed as being more legitimate than in the past. RFF hosted a workshop on just this topic two years ago (see the Resources listing in “For More Information.”). This workshop included government representatives, elected officials, scientists, and business people from Russia. It would be a stretch to say that our Russian partners fully embraced a broad, participatory model. However, the movement over the last 10 years away from an expert-driven process focusing on scientifically credible but impractical ideas toward a more inclusive process emphasizing ideas that can be implemented was significant.

Still, what many NGO efforts continue to lack is a broader connection to local government and business interests that may make or break an effective environmental coalition. Mutual self-interest is an essential

<table>
<thead>
<tr>
<th>FREQUENCY WITH WHICH NGO WORKS WITH DIFFERENT STAKEHOLDERS</th>
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<tbody>
<tr>
<td>scientists</td>
</tr>
<tr>
<td>other Russian NGOs</td>
</tr>
<tr>
<td>educators</td>
</tr>
<tr>
<td>international NGOs</td>
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<td>local elected officials</td>
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<tr>
<td>local gov't. institutions</td>
</tr>
<tr>
<td>business/industry</td>
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Source: Original data collected by author in 1999. For further details, see RFF Discussion Paper 02-04, listed in “For More Information.”
motivation in a weak legal setting with underfunded regulatory oversight. How can this be encouraged or, more broadly, how can the efforts of both local and national NGOs be furthered and strengthened?

Placing Russian NGOs on solid legal and tax footing would greatly enhance their contribution. At present, the tax policies toward NGOs and all other non-state entities are vague and uncertain, lack clearly outlined legal grounds, and are ad hoc. Signals are mixed about whether the current Russian administration favors such changes, and how they will play out over the next several years is a matter of internal Russian politics. However, international pressure, coupled with Russia's desire to join or become a full-fledged member of the World Trade Organization and the Group of 8 countries may provide incentives for legal and fiscal reform that strengthens the legitimacy and stability of NGOs.

TABLE 3

| Percentage of Respondents Who Rank Factor As One of the Three Most Important |
|-----------------------------|---------|
| legal requirements          | 89      |
| scientific justification    | 68      |
| views of local public       | 43      |
| implementability            | 24      |
| views of local government   | 19      |
| fairness to other groups    | 4       |
| views of local industry     | 4       |
| cost of action              | 4       |

Source: Original data collected by author in 1999. For further details, see RFF Discussion Paper 02-04, listed in “For More Information.”

Improved coalition building also is essential. NGO partnerships with local businesses, local citizens, religious groups, elected officials, and government bureaucrats will be critical in an environment where relational capital is a key driver of decisions and where courts of law lack the independence or standing to guarantee basic protections. As such, long-term assistance from western governments, foundations, and multilateral development banks to Russian NGOs and their partners to improve outreach, public relations, and coalition-building skills may yield high payoffs.

Finally, support for independent assessments of policies affecting Russian environmental planning and management is sorely needed. These assessments must not only rest on solid science and policy analysis, but also be grounded in the realities of Russian institutional failures. To achieve this goal would take full participation in a coalition of policy analysts, business representatives, government officials, and NGO representatives, where the focus would be on problems that are realistically open to intervention. This model, while still drawing on the common Russian respect afforded to scientific and technical experts, could expand the decisionmaking process to include all sides.

To neglect the problems that pollution in Russia poses to its 140 million residents would be imprudent. Moreover, the country is too big a player in climate change, natural resource supplies, nuclear safety, and other global concerns to be ignored by the world community and too important in geopolitical terms to risk environmental instability. Yet, Russia will continue to have structural issues that impede environmental progress in the foreseeable future—its large size, limited public funding, and tough natural conditions—and these must be accepted. It’s tempting to promote broad sweeping changes to get at what appear to be more amenable institutional problems,
such as placing higher values on nature or establishing competitive market relationships and eliminating corruption. While these are, of course, worthy goals, they involve seismic institutional shifts that are unlikely to appear in the short run. Instead, a more pragmatic approach supported by assistance from the West to solidify the legal and tax base of NGOs, their coalition-building skills, and their capability to conduct independent, pragmatic policy analyses could more quickly push Russian environmental policy and management decisions in a more desirable and less enigmatic direction. ■

Kris Wernstedt is a fellow at RFF.

For More Information


Even though the environmental and public safety benefits from higher taxes could be substantial, the United States has the lowest gasoline tax among industrial countries for a number of reasons.

Gasoline taxes vary dramatically across different countries. While the United Kingdom has a gasoline tax equivalent to $2.80 per gallon, the highest among industrial countries, the United States has the lowest tax of 40¢ per gallon (18¢ federal tax and on average about 22¢ state tax) (see Figure 1). It is commonly thought that Europeans have a greater tolerance for high fuel taxes than Americans, as they have shorter distances to travel and better access to public transport, although the fuel tax protests in Britain in September 2000 suggested that the political limits of such taxes might have been reached.

A number of arguments are made for implementing high gasoline taxes. By discouraging driving and fuel combustion, gasoline taxes help to reduce local air pollution, carbon dioxide emissions (a greenhouse gas), traffic congestion, traffic accidents, and oil dependency. Taxing gasoline is one way of forcing people to take into account the social costs of these problems when deciding how much, and what type of vehicle, to drive.

Gasoline taxes also provide a source of government revenues. In Britain, gasoline tax revenues are several times highway spending, and the Labour government has argued that if gasoline taxes are reduced, schools and hospitals will have to close. But this argument is somewhat misleading as the revenues could always be made up through other sources, such as income taxes. The real issue is what level of gasoline taxation might be justified when account is taken of the full social costs of driving, and the appropriate balance.
between gasoline taxes and other taxes in raising revenues for the government.

ENVIRONMENTAL EFFECTS

Gasoline combustion causes local air pollution, notably smog and carbon monoxide. This pollution can reduce visibility, but its main harm is to human health. For example, poor air quality can exacerbate respiratory problems and lead to premature mortality. Economists have assessed the damages caused by air pollution using epidemiological evidence on the link between air quality and human health, and studies estimating people’s willingness to pay to reduce risks of adverse health effects. Damage estimates have fallen over the last 20 years or so as the vehicle fleet has become cleaner, at least partly in response to emissions-per-mile regulations that are imposed on new vehicles. According to a recent study by Kenneth Small and Camilla Kazimi (University of California–Irvine), pollution damages are around 2¢ per mile (after updating to 2000), or about 40¢ per gallon, though there is still much uncertainty over these estimates.

Economists have also attempted to assess the potential damage from carbon emissions, such as the economic damage to world agriculture from future climate change and the costs of protecting valuable coastal regions against rising sea levels. These estimates are highly speculative; for example, it is difficult to value the ecological impacts of climate change, to allow for the small possibility of catastrophic climate change from instabilities within the climate system, and there is much controversy over the appropriate discount rate to use for converting future damages into current dollars. A typical estimate from the literature is around $25 per ton of carbon, which translates into only 6¢ per gallon, though some studies obtain much higher numbers. These preliminary figures suggest that advocates of higher transportation taxes to reduce carbon emissions may be on weak ground. Their efforts might be better spent focusing on reducing combustion of other fossil fuels, particularly coal.

TRAFFIC CONGESTION AND ACCIDENTS

Raising gasoline taxes nationwide is not well suited to addressing traffic congestion, which is specific to certain roads in urban centers at particular times of day. Gasoline taxes do encourage people to use public transportation and to car-pool, but they also penalize driving on uncongested roads, such as in rural areas or urban centers on weekends. A much better way to alleviate congestion on, say, I-66 in the northern Virginia suburbs of metropolitan Washington, DC, would be to charge people to drive on the road at
IS GASOLINE UNDERTAXED IN THE UNITED STATES?

peak periods. (This could be done electronically by deducting from a pre-installed credit card on the windshield). Time-of-day pricing would be more effective at reducing congestion than gasoline taxes as it would encourage people to use busy roads at off-peak periods and look for alternative routes. With regard to accidents, it would be better to tax a driver’s annual mileage, taking account of vehicle type and personal characteristics (such as experience and prior crash history). And raising the penalties for drunk drivers would be a more direct way to reduce alcohol-related crashes.

Nonetheless, peak-period fees and mileage related taxes have not been widely implemented in the United States (though there have been limited experiments with congestion pricing in California and Texas). Gasoline taxes might be the next-best response for curbing congestion and accidents, so it is still appropriate to consider congestion and accident benefits in an overall assessment of gasoline taxes. For congestion, this would require estimating marginal congestion costs averaged across both urban and rural roads and peak and off-peak travel periods, for the whole United States. Congestion costs are measured by the extra time it takes to drive under congested conditions compared with free-flowing traffic, multiplied by the monetary value of travel time (usually taken to be about half the market wage). Based on the available evidence, Kenneth Small and I concluded that the best estimate for the “averaged” congestion cost is about 3.5¢ per mile, or 70¢ per gallon.

The cost to society from traffic accidents largely depends on human fatalities and injuries—in the United States around 40,000 people are killed on the roads each year. Other costs include traffic hold-ups and property damage. The costs of fatalities and injuries include not only economic costs (such as medical expenses) but also the personal or “quality-of-life” costs; economists usually measure people’s willingness to pay for improved safety at the equivalent of several million dollars per fatality avoided.

It is very tricky to decide what portion of accident costs individuals might take into account in their driving decisions, and what portion they might not consider. It seems plausible that people will take into account the injury risks to themselves (and other occupants of their vehicles), and some of the property damage if they anticipate higher insurance premiums in the event of a crash. Most likely, they will not take into account the costs of traffic delays or the injury risk to pedestrians.

Whether one person’s driving raises the accident risk to other drivers is not clear: the frequency of collisions rises with more traffic, but, if people drive more slowly or more carefully in heavier traffic, a given accident will be less deadly. Based on earlier work by Mark Delucchi (UC–Davis) and the U.S. Federal Highway Administration, Kenneth Small and I put the average accident externality at around 3¢ per mile (60¢ per gallon) for the United States, although there is a wide range of other plausible estimates.

Adding up the tally of the costs of driving that individuals do not take into account gives a total, so far, of $1.76 per gallon, which is a substantial amount (though the uncertainty and controversy surrounding damage estimates should be borne in mind). However, a major problem with the gasoline tax is that it taxes fuel rather than distance traveled. Over the long haul, it is estimated that roughly 60% of the tax-induced reduction in gasoline will be from improvements in fuel efficiency (people buying smaller cars, retiring older, fuel-inefficient cars more often, etc.); only about 40% will come from people driving less. For each gallon of gasoline reduced by fuel taxes, the accident and
congestion benefits are only 40% as large as they would be if all of the reduction in fuel were due to reduced driving and none to improvements in fuel efficiency. Since imposing fuel taxes also creates economic costs by altering travel behavior, this reduction in benefits results in the optimal tax being smaller by a similar portion. Adjusting the above figures reduces the appropriate gasoline tax to less than a dollar.

GASOLINE TAXES AS PART OF THE OVERALL TAX SYSTEM

Gasoline taxes also provide revenues for the government and this raises the issue of whether the ability to provide revenues constitutes a reason to set higher levels of taxation than warranted on the grounds of pollution, congestion, and accidents. Leaving aside other considerations, whether it is better to finance some of the government’s budget through gasoline taxes or not depends on the economic costs of gasoline taxes compared with other taxes, such as income taxes. Income taxes lead to economic costs or “excess burdens” because they distort the overall level of employment in the economy; for example, by reducing take-home pay they reduce the labor force participation rate of married women. Gasoline taxes cause economic costs by changing travel behavior and raising transportation costs for businesses.

Economists usually find that it is less costly to raise revenue from taxes with very broad bases, such as income taxes, than narrowly focused taxes on specific products that are easy to avoid by spending on other products. However, exceptions to this rule are products whose demand is relatively insensitive to price, which is the case for gasoline. Consequently, some level of taxation might be appropriate, in excess of that justified for curbing pollution, congestion, and accidents. Kenneth Small and I calculated this component of the optimal tax at roughly 20¢ per gallon for the United States.1

Taking account of both the revenue-raising benefits and the benefits from reduced fuel consumption, the optimal gasoline tax is just over $1 per gallon for the United States, according to our estimates, though the estimate is sensitive to different assumptions and may change over time. This is 2.5 times the current U.S. gasoline tax, but still less than half of the current tax rate in the United Kingdom.

It is often thought that low-income groups bear a disproportionate burden of gasoline taxes, although the actual evidence on this is more mixed. For example, a study by James Poterba (MIT) found that spending on gasoline as a share of total household expenditure was only slightly lower for the richest 10% of households than for the poorest 10%, and the gasoline expenditure share was highest for middle-income groups. In my view, gasoline taxes should mainly be evaluated by weighing their overall economic benefits and costs. Distributional concerns are much better addressed through altering the progressivity of the income tax system, or providing a safety net through the benefit system.

OTHER ARGUMENTS FOR GASOLINE TAXES

The September 2001 terrorist attack, the recent debate in the House and Senate over competing energy bills, and fears about a resurgent Organization of Petroleum Exporting Countries (OPEC) have

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1 This calculation assumes that extra gasoline tax revenues would substitute for income tax revenues, leaving total public spending the same. If extra revenues instead financed more highway spending, the optimal gasoline tax could be higher or lower, depending on whether the social benefits of the extra spending were larger or smaller than the social benefits of lower income taxes.
heightened concerns about U.S. dependency on imported oil, particularly from the Middle East. Oil dependency makes the U.S. economy vulnerable to volatile oil prices that might result from deliberate exercise of market power or changes in world market conditions. However, the United States will always be vulnerable to oil price fluctuations—regardless of how much it imports from the Middle East—because the domestic price of oil is determined by the world price. The only way to reduce the economic disruptions from volatile world oil prices is to reduce the oil intensity of the U.S. economy.

In principle, an economic argument can be made for some level of gasoline taxation on the grounds of macroeconomic vulnerability, although a broader oil tax would be a more appropriate policy. Changes in oil prices can impose costs elsewhere in the economy that are not taken into account by energy producers and consumers. For example, it is costly in the short term for other firms to adjust their capital stocks in response to sharp, and unforeseen, swings in oil prices. A recent report on fuel economy standards by the National Research Council put the economic cost of our dependency on foreign oil at less than 12¢ per gallon.

Some people argue that we need to maintain a larger military in order to ensure uninterrupted oil supplies from the Middle East. The amount of extra military expenditure is tricky to assess; for example some Middle East military spending is to protect the security of Israel. Moreover, most research, for example a study by Douglas Bohi and Michael Toman at RFF, suggests that we may not need to spend more to ensure a continued supply of imports because it would be hard for Middle East countries to prevent other countries they supply from redirecting oil to the United States. Even if they were successful in stopping such shipments to the United States, the sharp increase in world oil prices would provide strong incentives for other OPEC members to defect and sell to the United States, or for non-OPEC suppliers such as Canada, Russia, and Mexico, to increase production.²

Another consequence of motor vehicle driving is the wear and tear on the road network that must be repaired at taxpayers’ expense. However most of the damage is caused by heavy trucks rather than autos; road damage increases exponentially with a vehicle’s axle weight so that a truck weighing 10 times as much as a car does one thousand times the damage. This problem really calls for a tax on diesel fuel rather than gasoline or, better still, a tax on truck mileage adjusted for axle weight.

There is a range of other unintended consequences associated with the production, transportation, and use of gasoline, including the costs of oil spills, leakage from storage tanks at refineries, and disposal of non-recycled cars. However, the costs involved tend to be small in magnitude relative to those of congestion, accidents, and pollution, and they are better dealt with by policies other than higher gasoline taxes.

THE POLITICS OF TAX REFORM

Congress has ducked the issue of whether to raise the Corporate Average Fuel Economy (CAFE) standards, which impose minimum miles-per-gallon requirements on sales of new vehicles, and left the National Highway Traffic Safety Administration to review and recommend new standards. The argument

² It could also be argued that the United States could raise gasoline taxes to take advantage of its market power in world oil markets. Effectively some of the burden of the tax increase would be borne by Middle East suppliers in lower world oil prices. This argument calls for an oil import tariff rather than a gasoline tax; however, it might do more harm than good by provoking retaliatory tariffs against the United States.
for tightening the CAFE standards is to address some of the factors discussed above, particularly greenhouse gases and oil dependency. However, a much more effective policy to address these two concerns would be to raise the federal gasoline tax. Higher gasoline taxes would reduce fuel consumption not only by encouraging the development of more fuel-efficient vehicles, but also by encouraging people to drive cars rather than sport-utility vehicles and minivans, to buy new (more fuel-efficient) vehicles more often, and to reduce the overall amount of mileage. Indeed, tighter CAFE standards would lower the cost per mile of driving, and could worsen some of the other problems discussed above, such as traffic congestion.

However, substantially higher taxes on motorists are not on the political radar screen for the foreseeable future; despite a major effort in 1993, the Clinton administration was able to raise the federal gasoline tax by only 4¢ per gallon, and the rate has remained unchanged since then. Nonetheless, there is considerable scope for reducing the social costs of driving, without increasing the overall burden of taxation to motorists as a group. For example, opposition to local peak-period pricing schemes—which are much more effective at reducing congestion than gasoline taxes—might be dampened somewhat by returning revenues collected to motorists in the form of lower state gasoline taxes.

For More Information:

INSIDE RFF

RFF ON THE MOVE: AN INTERVIEW WITH BILLY PIZER

RFF Fellow Billy Pizer recently returned from a one-year stint at the White House Council of Economic Advisers, where he served as a senior staff economist, a position that has been held by several other RFF researchers. Resources caught up with him to find out what the experience had been like.

RESOURCES: What did you work on while you were at the Council of Economic Advisers (CEA)?

PIZER: I mainly focused on climate change issues. One of the interesting things about this position is it’s different every time; a lot depends on what’s going on. Shortly after coming into office in January 2001, President Bush rejected the Kyoto Protocol, saying that it didn’t serve U.S. interests. In June 2001, he gave a speech in the Rose Garden, where he talked about how America remains committed to the framework of climate change, with policies that emphasized science and technology. After I came on board, the focus shifted to development of a mitigation policy.

I worked closely with the staff at the Council of Environmental Quality, which was tasked with developing policy options that were then run through the Cabinet-level working group, which in turn offered recommendations to the president. This is where the idea arose for a goal for curbing greenhouse gas intensity instead of absolute emissions.

The group studied a range of possible targets, including the eventual choice of an 18% intensity reduction over the next 10 years. Finally, there was the idea that firms and individuals that demonstrated real reductions should be issued transferable credits for those reductions, which could be used against some future obligation.

RESOURCES: What’s the status of the proposal?

PIZER: An interagency working group met regularly over the past few months to discuss ideas for reforming the program. There also were outreach efforts, including soliciting public comments and issuing a formal notice of inquiry. The Secretary of Energy recently issued recommendations to the president regarding principles for the program and a proposed implementation schedule. If all goes forward...
as planned, the program may be up and running by the end of 2003. (Note: The recommendations are available at www.energy.gov/HQPress/releases02/julpr/pr02136.htm, accessed July 22, 2002.)}

**RESOURCES: What are the pros and cons of this approach?**

**PIZER:** A significant advantage is that this program could be implemented solely through administrative actions without involving Congress at all. The disadvantage, for many people, is that the program is strictly voluntary, with no mandatory reductions. But everything is a signal, you have to interpret these actions and act accordingly.

**RESOURCES: How did your RFF background particularly contribute to your work at CEA?**

**PIZER:** I came in well prepared for the climate change work, having covered this issue from a lot of different vantage points. And I greatly benefited from the wisdom of people like Dick Morgenstern, Mike Toman, Ray Kopp, Richard Newell, and others. These people really helped me form my ideas and opinions about how an emissions trading system would function.

**RESOURCES: What will you take away from the experience? What are you going to do now that you’re back?**

**PIZER:** It has been an invaluable experience learning how all these clever theoretical ideas you have about prices and quantities, or the upstream regulation of carbon dioxide, mesh with technical and political constraints and don’t always turn out to be possible. What I’ve come away with is a much greater appreciation for the policymaking process and an awareness of the need to consider the state of technical knowledge about a given area, the stakeholders, their experience with market mechanisms, and so on. Now that I’m back, I’m going to need to rebalance my research portfolio. I’m very interested in thinking about what you have to do to make these complex policy ideas more practical.

And I’m very interested in what we at RFF can do to better inform public discourse. One of the things you don’t ever realize until you’re on the flip side of the news is how misinformed the media can be about environmental issues. I would read articles about issues where I had first-hand knowledge of what was going on and what the policy was really about. Even stripping away all the political rhetoric on both sides, reporters still struggle to get the facts right.

I think there is really a valuable role for RFF to play as broker of information, explaining both sides of a problem. We have the capacity to present things in a more objective way because we don’t lobby and we don’t raise money based on the positions we hold, which is how everybody else does it.
RFF FELLOW AWARDED FULBRIGHT SCHOLAR GRANT

RFF Fellow Carl Bauer was awarded a Fulbright Scholar Lecturing/Research Grant, to be used at the National University of Cuyo, in the city of Mendoza, Argentina, in Spring 2003.

The research component of the grant is titled “Water and Power Markets in the Southern Cone,” and will allow Bauer to pursue the Argentine portion of his continuing comparative research on water law and policy in Chile, Argentina, and the United States.

The lecturing component is titled “Comparative Law and Economy of Natural Resources and Environment,” and calls for Bauer to teach a seminar on his area of research, focusing on water law, policy, institutions, and political economy in Latin America and the United States. He will also give invited talks at other Argentinian universities during his stay.

Fulbright grants are funded and administered by the U.S. government to encourage international academic exchanges.

RFF SCHOLAR HONORED

RFF University Fellow and Visiting Scholar Wallace Oates was recently awarded the Holland Medal by the National Tax Association for his “distinguished lifetime contributions to the theory and practice of public finance.” His research focuses on the role of different levels of government in fiscal and environmental regulation. He also works extensively on environmental economics, in particular the use of economic incentives for environmental protection. He is a professor of economics at the University of Maryland-College Park.
RFF researchers continue to bring their work to the world at large. The following is just a sample of RFF outreach efforts over the past few months.

RFF figures prominently in the July 6 Economist special survey on the global environment. Several researchers spoke to author Vijay Vaitheeswaran and Paul Portney was quoted directly.

RFF Senior Fellow James Boyd recently contributed to an Environmental Protection Agency (EPA) Science Advisory Board report, Underground Storage Tanks (UST) Cleanup and Resource Conservation and Recovery Act (RCRA) Subtitle C Program Benefits, Costs, and Impacts Assessments. An SAB Advisory. The report evaluated EPA’s methodology for assessing the social benefits of the Underground Storage Tanks UST cleanup program and RCRA Subtitle C, which regulates landfill management.

David Simpson presented a paper on “Cost Effective Conservation” at the recent BioEcon research consortium meeting in Rome, which was funded by the European Union. He also participated in a conference at the Kiel Institute for World Economics on globalization and the world economy, where he discussed a paper on biodiversity and globalization by Columbia University’s Geoff Heal.


Majid Ezzati gave a presentation at a recent National Institutes of Health-sponsored meeting on the health issues of aging populations in developing countries. Ezzati also gave two presentations at the recent World Bank-sponsored session on developing-country issues at the recent “Indoor Air 2002” conference in Monterey, CA. The first was on greenhouse gas implications of household energy use in developing countries based on the results from his research in Kenya; the second presentation was on the health implications.


Alan Krupnick had several discussions with the Washington Post’s Dan Morgan about the Clean Air Act, the Bush administration’s Clear Skies Initiative, and the New Source Review program.

At the invitation of the Pan American Health Organization, Richard Morgenstern, consulted with Mexico’s Secretary of Health on environmental health issues.

Elena Safirova was interviewed by Liz Halloran, a columnist with the Hartford Courant, on her “slug lines” project. In a project with Winston Harrington, Safirova is studying a unique transportation phenomenon: commuters pick up strangers at designated locations in order to satisfy the requirement for using “high-occupancy vehicle” highway lanes. The researchers are trying to uncover why slugging occurs so far only in Washington, DC, and Oakland, CA.
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