



RFF SENIOR FELLOW KATE PROBST TO SERVE ON EPA SUPERFUND PANEL

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 (NO_x) from the electricity sector at about 25% of their 1997 levels (about 2.25 million tons for SO₂ and 1.5 million tons for NO_x), 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 NO_x



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, NO_x, 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 brinkmanship 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 NO_x, 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



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 NO_x reductions also are relatively flat over the range of

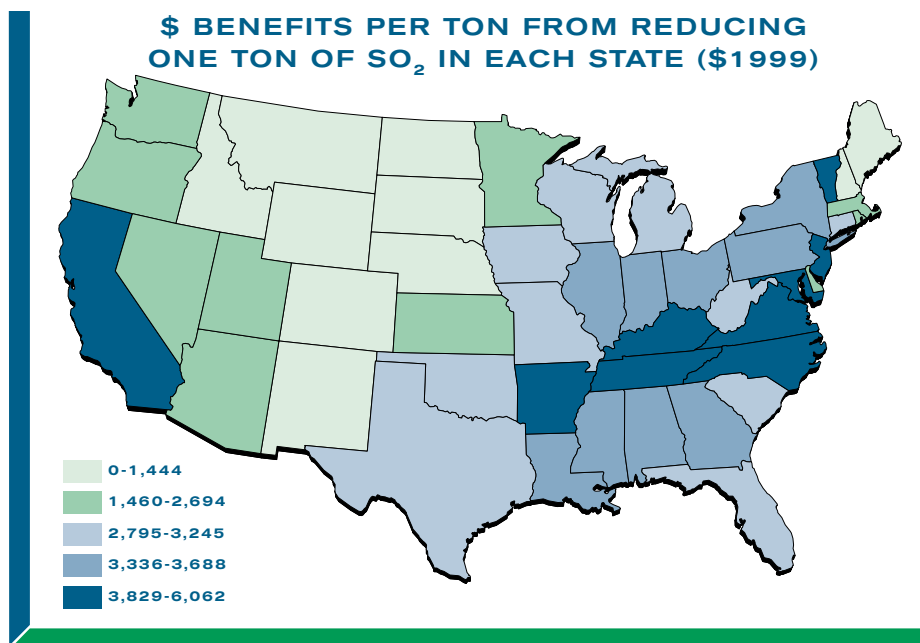
reductions contemplated, with a best-estimate value of about \$1,100 per ton reduced and a confidence interval ranging from about \$700 to \$1,600 per ton. Marginal costs are increasing throughout the range and begin to outweigh marginal benefits at about 2.1 million tons—the level proposed by the Bush 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.

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.

FIGURE 1



Source: RFF data



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.