

## **Achieving Environmental Goals at Minimum Economic Cost**

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As Murray Weidenbaum says, it is striking that energy today ranks relatively low in the public consciousness in terms of policy issues, at a time when the sector is changing so rapidly. In my view, the quality of the public discussion of energy issues is in need of improvement. I particularly have in mind environmental concerns. As with much else in Washington, the debate is highly polarized. On the one hand are some who believe that the government should not interfere with private business in the name of the environment at all, that it is necessarily ruinously expensive and – in the case of global climate change – that there may not even be a problem to be addressed. On the other hand are others who wish to pursue absolute environmental goals with no attention to economic cost, or who conveniently claim to believe that there will be no economic cost.

The truth is that there is a valid and important role for the government to play, because people care about clean air and other environmental goods, and because the market cannot address the problems on its own. Pollution is what we economists call an externality. But energy needs can in fact be reconciled with environmental goals. The two are not incompatible. Neither do they coincide perfectly, of course. We can't get far toward our environmental goals if we limit ourselves purely to zero-cost steps. But we *can* get far with low-cost steps, provided they are the right ones. The key is to do everything as efficiently as possible. We can afford adequate energy *and* clean air. It is only inefficient energy policies that we can't afford.

Measures should be as market-oriented as possible. They should leave private industry the flexibility to achieve environmental goals in whatever way it sees fit, so as to be able to minimize costs. A good example is using tradable permits to implement a limitation on emissions. Where an individual plant, or an entire firm, would find it extremely expensive to reduce emissions, it can buy permits on the marketplace. Where another plant or firm would find it economical to reduce emissions even beyond its proportionate share, it can sell the extra permits, reaping a profit which is its incentive to make the reductions.

Moral suasion can go a certain distance. But only by getting the price signals right, will firms and consumers face the proper incentives to conserve energy and choose relatively cleaner processes and products. In this way, society can achieve a given environmental goal at minimum economic cost, or achieve maximum environmental benefit for a given economic cost.

I will illustrate in five areas: electricity restructuring, regulatory reform, technology, fuel mix, and Kyoto.

Electricity deregulation can be economically beneficial with no environmental cost. Estimates cited in the NERA study are that competitive pressures could reduce electricity prices in 2020 almost 20% below current levels.

The benefits to consumers and industry at large are clear. What about the environmental effects? It is true that by reducing the price of electricity to consumers, it can be expected to stimulate total demand, including greater use of existing coal-fired plants, which will increase pollution. But on the other hand, it can be expected to increase efficiency, both in the engineering and economic senses, with the result that there will be less pollution per unit of energy produced. I can't claim to be sure how these two forces will net out.

Now to an example of an existing regulation that could be made more market-oriented and thereby more efficient: New Source Performance Standards. Currently, new plants must use the best available control technology. This can make it uneconomical to open a new plant even if it would be cleaner than an existing plant. The solution is to allow a producer to open a new plant with emissions above the "Lowest Achievable Emissions Rate" provided it creates or buys offsetting reductions elsewhere, for example by shutting down an old plant.<sup>1</sup>

So those are some illustrations of what I mean when I say that environmental goals should be implemented in market-friendly ways.

When I arrived at the White House in 1996, I was expecting to find the environmentalists in the government insufficiently appreciative of market mechanisms. I must say, I was pleasantly surprised to find that things have changed in this respect. They have been won over to the magic of the marketplace. The SO<sub>2</sub> trading scheme, which is widely considered a success, did much to convince environmentalists that permit trading is not just a preoccupation of economic theorists, but a practical and cost-minimizing way to achieve an environmental goal. Command-and-control is now a dirty word in Washington. Indeed, I found that the environmentalists in the Administration sometimes out-did the economists in their enthusiasm for the magic of the marketplace. Sometimes we had to remind them that a market in permits cannot necessarily spring up *ex nihilo*. Certain pre-requisites must be met, particularly a spelling out of the rules of the system and the allocation of property rights [and perhaps also a certain critical mass of volume to assure sufficient liquidity].

Governments are not especially good at picking winners and losers -- even in the area of technology. It is true that we cannot solve some of our major problems like global climate change without technology. It is also true that technological discovery and

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<sup>1</sup> A second example: As I understand it, allowances for NO<sub>x</sub> pollution are determined in terms of "Parts Per Million" in power plant exhaust. This gives no incentive to reduce fuel use per unit of electricity output. If the regulation were phrased in terms of "pounds of NO<sub>x</sub> per MegaWattHour of electricity produced," firms would have better incentives.

innovation has spillover benefits that accrue outside the firm where it originates, and that therefore the government has an important role to play in supporting research and development. But the government cannot identify which technologies will be successful.

Consider the example of the fuel mix, the subject of the NERA project. The existing trend in fuel mix over the next 20 years, as explained in the study, is toward natural gas (from 14% today to a projected 32% in 20 years).<sup>2</sup> If we are to reduce emissions of greenhouse gases over the next 10 and 20 years, it is inevitable that this will mean among other things an acceleration of the shift into natural gas, and a shift out of coal. As I have said, I believe that price signals are the most efficient way of accomplishing such a shift. But there are some who argue that, because the technological future lies with low-carbon fuels – whether it is solar power or fuel cells or something else -- a forcing of the pace will produce technological breakthroughs that will pay for themselves economically. We can save money at the same time that we save energy and emissions. I daresay such potential technologies do indeed exist. But I don't see how one knows ahead of time which ones they are. To my mind, if the price on carbon emissions is set right, the market will respond appropriately in its decisions of what sort of technologies are most promising to pursue, much as it responds in its other decisions. There are also some who argue that the key future technological breakthrough lies with gasification of coal and sequestration of the carbon emissions. There is a fear that we might switch from coal to natural gas in the short run, only to have to reverse course 20 years from now. Again, I have no way of evaluating whether the technological future implies accelerating the trend in the fuel mix or retarding it. I can only trust in the market to make the decision.

### ***Kyoto policy-making process and Administration Economic Analysis***

I am going to devote the remainder of my remarks on the subject to the Kyoto Protocol on Global Climate Change. It is important to note, as David Harrison clearly does, that the more extreme scenarios for the impact of regulation over the next twenty years are heavily driven by Kyoto (and that means a Kyoto without developing countries), much more than by changes under the Clean Air Act or other regulations.

The first question we faced in negotiating the Kyoto Protocol was “How aggressive should the targets be?” There is a good argument for phasing in emission cuts slowly, far more slowly than the Europeans wanted in any case. It would be very expensive to junk the entire capital stock of coal-fired power plants before the end of their natural life (or to shut down nuclear power plants if we were to need them later). Much better to give plenty of advanced notice of future goals, and give companies the incentive to build carbon-lean plants over time as the old ones wear out. On the other hand, the announcement of an agreement by politicians today to begin cutting emissions 50 years in the future would be worthless. They can't commit their successors, and everyone knows it. No positive signal would be sent by such an agreement. Some

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<sup>2</sup> .Which will enhance diversity, in the sense that the leading fuel, coal, will no longer be three times the share of the nearest competitor [currently 53% coal = 3 \* 18% nuclear (vs. 14% gas); in 2020, coal = 50%, vs. 7% nuclear and 32% gas.

meaningful target has to be set in the ten-year horizon, or the entire exercise would lack any credibility.

In July 1998, we released the Administration's Economic Analysis of the Kyoto Protocol, which had been negotiated 7 months before.

I believe in cost-benefit analysis in general; we need more of it in regulation. But the difficulties of doing full cost-benefit in this case were prohibitive, especially the difficulties of trading off large but uncertain benefits in the far-distant future for certain costs in the near-term future. In the Administration Economic Analysis, we opted not to attempt full cost-benefit analysis, and instead to explain the cost-minimizing way to achieve the goals set at Kyoto for the period 2008-2012 [7% reduction for the US, relative to 1990], and to show that the costs are actually rather modest if the treaty is implemented in that way.

Three issues: domestic implementation, international trading, and global participation. As should already be clear, I believe that a system of tradable permits is a far more efficient way of implementing domestic reductions than anything resembling command and control.

International trading of emission permits is also key. Russia can make reductions far more cheaply than we can. The CEA estimate is that trading among the signatory countries would reduce the cost of meeting our Kyoto target by half.

Equally important is participation by developing countries. The President has said he would not submit the treaty for Senate ratification without meaningful participation by developing countries, which is not currently incorporated into the Protocol [or in the Berlin Mandate on which it is based]. There are a lot of reasons why we need the developing countries in the system. But I will mention just one: If the LDCs join in target and trade, we estimate that it will reduce costs by 80% altogether (relative to no international trade). Down to a range we consider modest: E.g. under these assumptions, Kyoto would raise the price of electricity only 3-4%. (On the same scale as the reduction in the price of electricity anticipated under restructuring.)

### *Prognosis*

Kyoto may never be ratified. The political chasms are too numerous and too wide to be readily bridged. (Between LDCs and US on the subject of their participation, between EU and US on international trading, and between Americans' expressed desire to combat global warming and their desire to drive SUVs.)

But there will be some successor agreement to address global climate change (a "Johannesberg conference" of 2005?), much as Kyoto itself succeeded Rio. When it does, I hope that the good aspects of Kyoto – the market mechanisms such as international permit trading – survive as the foundations of the successor.