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BOOTLEGGERS, BAPTISTS, AND GLOBAL WARMING

BY BRUCE YANDLE

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To the Reader

As nations argue over what to do about global warming, Bruce Yandle brings a new insight to the discussion. Yandle's "bootleggers and Baptists" theory explains otherwise puzzling features of the international negotiations over cutbacks on fossil fuels. "Bootleggers, Baptists, and Global Warming" looks at the Kyoto Protocol through the lens of public choice economics.

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new and enhanced stage upon which
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This post-Kyoto drama is not a pleasing sight."

Introduction

Since the conference on climate change in Kyoto, Japan, in December 1997, the world's industrialized nations have been grappling with the realities of a costly treaty. Passionate expressions of concern about global warming have given way to tough political bargaining over who bears the pain. The stakes are high. The decisions made in the near future—including the decision by the United States to ratify or not—will determine which countries, which industries, and which firms (if any) will bite the bullet of costly reductions in carbon emissions.

The Kyoto Protocol calls for thirty-eight countries in the developed world to cut greenhouse gases to roughly 95 percent of 1990 levels by 2008–2012. This will happen mostly by reducing the use of fossil fuels that emit large quantities of carbon dioxide (United Nations Framework Convention on Climate Change 1997).

Total emissions of carbon dioxide and other greenhouse gases (primarily methane and nitrous oxide) are much larger than they were in 1990. Thus, the industrialized countries, and especially the United States, face a daunting and perhaps impossible challenge. The United States must reduce the emissions projected for

the years 2008 to 2012 by some 40 percent to meet its goal of reducing 1990 level emissions by 7 percent.

Yet the developing world, which emits large quantities of greenhouse gases, faces no challenge at all. By the terms of Kyoto, developing countries can continue to expand their output of carbon. So, with major emitters cutting back and minor ones expanding, it is highly likely that total carbon emissions will be larger in the future, not smaller, in spite of Kyoto.

This situation suggests that more is going on as a result of Kyoto than a commitment to reduce carbon emissions. The Kyoto Protocol creates a new and enhanced stage upon which nations, groups, and companies can pursue their special interests. The treaty opens up opportunities for favor-seeking that were previously closed. This *PERC Policy Series* paper will look at the activities of companies and national governments in the light of a "bootleggers and Baptists" theory of regulation. It is not a pleasing sight.

THE KYOTO CHALLENGE

The Kyoto Protocol,[1] which evolved over the past decade, has as its fundamental premise the idea that developed countries, which are large energy users and greenhouse gas producers, should bear the brunt of reducing emissions to avoid climate change. By the years 2008 to 2012, developed countries aim to bring their total greenhouse gas emissions to 5 percent less than they were in 1990. Meanwhile, developing countries will be expanding emissions at roughly 3 percent per year.

To give the reader an idea of the relative emission magnitudes, in 1990 the industrialized world, with the United States leading the pack, produced roughly 64 percent of all greenhouse gases, which then totaled 6 billion tons annually.[2] The developing countries produced the remaining 36 percent, led by China with approximately 11 percent. If emissions are not controlled, emissions for the year 2015 are expected to be 8.45 billion tons, with the developing countries producing 52 percent of the total. By the year 2100, forecasts (again, assuming no controls) call for a total of

19.8 billion tons of greenhouse emissions, with the developing world producing 66 percent.

These forecasts are far from certain. However, because only the industrialized countries are expected to cut back, it is unlikely that the goal of limiting total emissions to 1990 levels will be met in the foreseeable future. Groups alarmed about global warming can still support the treaty on the grounds that carbon emissions may decline eventually. But others, including companies and countries who want bigger markets, appear to be paying more attention to the strategic here-and-now possibilities offered by regulation under the Kyoto Protocol. There will be winners and losers in the post-Kyoto struggle, and expectations about who will win and lose are guiding much of today's political jockeying.

The Post-Kyoto Future

It is clear that if the Kyoto Protocol is fully implemented the relative prices of major energy commodities will change. Economic studies show that the demand for natural gas will rise, and to a lesser extent the demand for oil, while the demand for coal will plummet. Many nations that now have comparative advantages based on large coal reserves and related technologies and manufacturing will lose those advantages. Certain ozone-depleting chemicals will be banned, expanding markets for their substitutes.

National governments will engage in trade with other governments, but the items to be traded will be such things as the still-undefined "marketable emission permits" and "offsetting" actions to reduce greenhouse gases. In addition, countries will make bilateral agreements to transfer clean technology and provide development assistance, possibly creating emission offsets for participating countries.

Marketable greenhouse gas emission permits are the centerpiece of the Kyoto Protocol, although the scope of the market and the trading process have not yet been defined. An emission permit is a right to consume carbon and emit carbon dioxide in the course of production or manufacturing. To carry out the protocol, govern-

ments are likely to define a fixed number of emission rights equal to their Kyoto goals and divide them up among present carbon emitters. Since the goal in most developed countries is less carbon than is now emitted, emitters will have to cut back their emissions or buy the rights to emit from someone else. Either action is equivalent to paying a tax on carbon emissions.

Under a permit system, firms or countries that face high costs in cutting back (or that want to increase their carbon output) would buy the rights to emit carbon from firms or countries that could cut back at lower cost. An international permit trading market is especially attractive to countries with high costs, such as the United States. Some countries with firms that have done little to control emissions could reduce their carbon output through relatively simple, low-cost changes. These credits could be purchased by countries facing high costs.

The concept of permit trading is so popular among influential economists that just starting a market in carbon permits sometimes seems to justify taking action on global warming, no matter what the economics or science might say. A permit market does offer the prospect of significantly reducing the control costs of achieving the goals of the protocol. That fact helped to generate support for the protocol.

Attempts by industries to restrict output and raise rivals' costs are encouraged rather than frowned upon in the name of global environmental protection.

In this new international environment, however, trade becomes quite different from trade as we normally think of it. Actions that might be seen as attempts by industries to restrict output and raise rivals' costs (what might be called attempts at cartelization) are encouraged rather than frowned upon in the name of global environmental protection. National policies that might be seen as violations of GATT (the rules that guide international trade) are viewed

benevolently. This change of attitude magnifies the ability of well-organized interest groups to obtain advantages by crafting the rules guiding these trades and agreements.

Other changes will also occur. When the Kyoto agreement was signed, it joined an estimated 180 other environmental treaties on deposit with the United Nations Secretary General.[3] These treaties are fundamentally different from national decisions to legislate in the interest of cleaner air or water. They seek to impose a homogeneous rule—in this case, greenhouse gas reductions based on 1990 emissions—on a diverse set of global communities. Economists know that a "one-size-fits-all" rule applied to diverse situations leads to waste and inefficiency. Furthermore, such rules can compromise constitutional constraints and domestic rules of law and property that normally protect property rights and spur competition in domestic economies.

Bootleggers and Baptists

To understand what is happening now in the implementation of the Kyoto Protocol, it is helpful to consider some theories that economists use to explain why regulation takes the form it does. Three basic theories of regulation will assist our analysis.[4]

The first is called the public interest theory, and reflects traditional views of regulation that prevailed before it was studied carefully by economists and political scientists. The theory simply states that governments attempt to maximize the collective well-being of citizens. According to this theory, politicians weigh the benefits and costs of policies and attempt to maximize net benefits for the public. For example, if taxes are to be imposed to reduce the harms from global warming, politicians will carefully calibrate and impose taxes in ways that cause the least economic impact.

The capture theory is more realistic. It is based on the idea that politicians attempting to serve the public interest encounter persuasive special interests. The dedicated politician is "captured" by the special interest group and begins to serve the wishes of the group (perhaps unwittingly). One problem with this theory is that

it does not help determine which of many special interest groups will succeed in winning the struggle.

The third and most developed theory, called the economic theory of regulation, asks us to consider the political arena as a marketplace where favors are bought and sold. Interest groups that have the most to gain or to lose will bid the highest prices for favors. Politicians dedicated to preserving their jobs, and needing large amounts of campaign funds, auction off the favors.

Under this theory, if carbon emissions are to be controlled, the politician will seek the group with the largest economic stake in the outcome (and therefore presumably the most generous with campaign funds) and favor that group. Competing groups will attempt to outbid the winner. Generally, the smaller the group, the more each member can gain by crafting regulatory rules. The larger the group, the less likely each individual member will have a strong reward or heavy burden as a result of the rules. So, small special interest groups usually are the most actively involved in the negotiations.

However, even this theory is incomplete. Being a small, well-organized special interest group is not enough. My theory of bootleggers and Baptists, a subset of the economic theory of regulation, further helps explain environmental regulation like that imposed by the Kyoto Protocol (Yandle 1983). While powerful interest groups still matter, this theory tells us that there must be at least two quite different interest groups working in the same direction—"bootleggers" and "Baptists."

The term stems from the southern United States, where in the past and even today Sunday closing laws prevent the legal sale of alcoholic beverages. This is advantageous to bootleggers, who sell alcoholic beverages illegally; they get the market to themselves on Sundays. Baptists and other religious groups support the same laws, but for entirely different reasons. They are opposed to selling alcohol at all, but especially on Sunday. They take the moral high ground, while the bootleggers persuade politicians quietly or behind closed doors. Such a coalition makes it easier for politicians to favor both groups. In other words, the Baptists lower the costs of favor-seeking for the bootleggers.

The post-Kyoto period promises to be rich with bootlegger–

Baptist coalitions. The Baptists are the active environmental groups pushing for ratification and enforcement of the treaty, and working to prevent backsliding. They are passionate and persuasive to the public as they argue that cutting back on carbon emissions is a moral necessity. They are creating a ground swell for action on the Kyoto Protocol.

Indeed, the protocol even enjoys a "Baptist" supporter that gets close to the name itself. It is the United Methodist Church. On December 17, just a few weeks after the Kyoto meetings, Jaydee R. Hanson, assistant general secretary of the United Methodist Board of Church and Society, pronounced his denomination's support for Kyoto (United Methodist News Service 1997). Hanson urged the U.S. Senate to "protect God's creation by ratifying" the agreement. Other denominations are doing the same.

To determine which groups are the bootleggers, we should search for special interest groups who are positioned to gain from regulatory enforcement and stringency or who must fend off losses that spring from proposed rules. In this role we see national governments, industries, and firms.

The Emerging Coalition

National governments are strategically positioning themselves to benefit from the negotiations while operating under cover of the international environmental groups sounding the alarm about global warming. When we survey the participants, we find that some countries, such as the United Kingdom, are positioned to exploit carbon reductions they have made in the past by raising the cost to economies that still rely heavily on coal. Other countries, including developing countries and some European nations under one proposal, are allowed higher emissions. They see opportunities for payments from the developed countries for reducing carbon emissions or for offsetting actions such as planting trees. In addition, within countries, some industries are favored by the rules and, within industries, some firms will also be favored. Meanwhile, environmentalists are running interference and providing cover.

Some signs of an emerging bootlegger-and-Baptist coalition are beginning to emerge. Environmentalists provide the cover story on which media attention is focused, while companies, industries, or countries work quietly in the background to gain benefits.

Alternative-Energy Bootleggers

In January 1997, Enron Corporation, a major provider of low-carbon natural gas, announced the formation of Enron Renewable Energy Corporation. The company indicated that it was "preparing to take advantage of the growing interest in environmentally sound alternatives of power in the $250 billion U.S. electricity market" (Salisbury 1998). The new division faces the difficult challenge of producing solar and other nontraditional energy products at costs that can compete with conventional energy sources. Not surprisingly, Tom White, Enron Renewable Energy CEO, endorsed President Clinton's $6.3 billion plan to fight global warming. This plan includes $3.6 billion in tax credits to spur the production and purchase of renewable energy and related technologies. Kyoto-justified taxpayer subsidies will make life easier for firms like Enron.

Other producers who have long enjoyed federal subsidies now hope to justify them in the glow of global warming. The National Corn Growers Association (1998) has been trying to stall congressional efforts to end the 5.4 cents-per-gallon federal tax incentive provided to producers of corn-based ethanol. Originally enacted on the dubious basis of providing energy self-sufficiency, the large ethanol subsidies were on shaky ground in early 1998. In April, the Renewable Fuels Association (1998a) joined forces with ethanol producers to celebrate Earth Day by calling attention to ethanol's beneficial effects on global warming. And Secretary of Agriculture Dan Glickman indicated his strong support for extending the ethanol subsidy, noting that "renewable fuels provide an important opportunity. . . to lower greenhouse gas emissions (Renewable Fuels Association 1998b).

Mary Nichols, U.S. EPA Assistant Administrator for Air and Radiation, had spoken in January 1998 at the National Ethanol Conference, telling the audience: "One area where I think we can

do more together is the area of climate change and global warming" (Stark 1998). No one mentioned that ethanol production is so costly that it might require more energy than it produces, or that half of the federal government's $600 million annual ethanol subsidy goes to one ethanol producer, Archer-Daniels-Midland.[5] Nor did anyone mention a literal bootlegger–Baptist connection: The taxpayer subsidy assists the production of beverage as well as industrial alcohol (Bandow 1997).

All this concentrated effort came to a successful conclusion on May 6, 1998, when House Speaker Gingrich salvaged the ethanol program, much to the dismay of Senator Bill Archer (R-Texas), who wanted to end the program because ethanol blends reduce demand for Texas-produced gasoline products (Pianin 1998). But global warming helped save the day for the corn producers.

Following in their American cousins' footsteps, the Canadian Commercial Alcohol Association trumpeted ethanol's carbon-reducing virtues. They suggested that any CO_2 produced by burning ethanol would be recycled into corn plant tissue, thereby yielding a net reduction in atmospheric carbon dioxide levels (Commercial Alcohols Canada 1998).

Producers who have long enjoyed federal subsidies now hope to justify them in the glow of global warming.

Not to be outdone by corn growers, the National Biodiesel Board, representing U.S farmers who produce soybean and other vegetable oil products, testified before Secretary of Energy Federico Peña on February 19, 1998. The board pointed out the environmental benefits of blending farm-produced oil products with diesel fuel (National Biodiesel Board 1998) and lobbied the Department of Energy (DOE) to give official approval to biodiesel as an alternative fuel. This would ensure a market through DOE programs. The trade association officials said that "biodiesel helps reduce the effects of global warming by directly displacing fossil hydrocarbons" (National Biodiesel Board 1998).

Natural Gas and Oil Bootleggers

While the ethanol and biodiesel bootleggers were joining with environmental Baptists, a coalition of major oil producers and other firms was having trouble keeping members opposed to Kyoto. The Global Climate Coalition, consisting of major oil firms and thousands of other firms, attempted to speak with one voice in debunking Kyoto's shaky scientific underpinnings and calling attention to the economic effects of the protocol. But in June 1998, Shell Oil announced it was leaving the coalition.

Claiming credit for Shell's green conversion, Friends of the Earth spokesperson Anna Stanford said, "We're delighted that our hard work has paid off, that Shell has bowed to public pressure and seen that the future lies in fighting climate change and investing in green energy. Now is the time to turn our attention to Exxon to make them follow Shell's lead" (Friends of the Earth 1998). Shell's response was that "there are enough indications that CO_2 emissions are having an effect on climate change" (Magada 1998). Being more specific about the firm's strategy, Mark Moody-Stuart, Chairman of Shell Transport and Trading, said that Shell is "promoting the development of the gas industry particularly in countries with large coal reserves such as India and China" (Magada 1998). What may not be obvious to the public is that tough implementation of Kyoto implies growing demand for natural gas.

Shell's departure from the Global Climate Coalition was made easier by British Petroleum's earlier defection. John Browne, CEO of British Petroleum (BP), stated that industry must play a "positive and responsible part in identifying solutions" to the global warming problem (EDF 1997). This sounds both concerned and responsible, just the sort of thing that environmental activists praise. But BP also expects to see an increase in demand for oil, its chief product, because oil is a substitute for coal that produces fewer carbon emissions. BP also announced a significant investment increase in solar and alternative energy technology development.

To be sure, many major industries, or at least major firms, still oppose Kyoto. Not everyone is teaming up with the Baptists. Coal producers and related unions are among the most vocal in

their opposition. Coal interests in West Virginia were successful enough to obtain state legislation prohibiting the state government from "proposing or implementing rules regulating greenhouse gas emissions from industrial sites," according to the press release issued by the office of Cecil Underwood, West Virginia's governor (April 2, 1998).

Yet even the coal-producing states are acting a bit like bootleggers. On signing the bill, Governor Cecil Underwood made his own overture to the Baptists. He indicated that while actions like the Kyoto Protocol must be opposed, we "should continue to encourage the development and implementation of technologies that allow the clean burning of coal." He supports research on clean-coal technologies (a term that in the past referred to production that emitted fewer pollutants but now includes production with fewer carbon dioxide emissions), if it is subsidized by the nation's taxpayers. The press release from the governor's office said that he and Governor Paul Patton of Kentucky, another coal-producing state, had persuaded the Southern Governors' Association to pass a resolution saying basically the same thing.

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Although corn producers who supply the raw material for ethanol see a pot of gold in Kyoto, farmers who must operate in a globally competitive market generally oppose it. Dean Kleckner, president of the 4.8-million member American Farm Bureau Federation, opposes the protocol "because of its potential harm to U.S. farmers," according to a Reuters report (March 6, 1998). Reinforcing his concern, Mary Novak, senior vice president of the consulting firm WEFA, Inc., predicted that food prices would go up 10 percent as a result of Kyoto. She also predicted higher fuel and fertilizer prices. There are winners and losers within the same economic sector.

Countries as Bootleggers

Even before ratification, some governments were taking steps to capitalize on the opportunities stemming from Kyoto. One country even found it possible to gain additional wealth for actions it was going to take anyway.

In April 1998, Costa Rica announced a new version of its program to save 1.25 million acres of rainforest. Costa Rican President Jose Maria Figueres said that environmental bonds called Certified Tradable Offsets (CTOs) will be sold to industrial firms. Each CTO corresponds to one ton of carbon that will be absorbed by trees. Under this arrangement, each CTO is backed by a specific number of trees left standing, which absorb one ton of carbon annually. By paying Costa Rica to protect its rainforest, polluters elsewhere can release more carbon emissions. The planned offsets will accommodate one million metric tons of carbon annually (Allen 1998). The program will be managed by the prestigious Swiss commercial inspection firm SGS. It will cost Costa Rica nothing, since it is something that the government is doing anyway, but it is expected to produce $20 million in revenues this year. Companies will pay $20 per ton of carbon emissions that are offset by the bonds. Costa Rica hopes to generate $300 million this way over the next twenty years.

About the same time, Japan and Russia engaged in what is believed to be the world's first greenhouse gas emissions swap (Takenaka 1998). The alliance illustrates Kyoto-inspired "offsetting" actions. Japan will send technicians to some twenty Russian power plants and factories to help them cut carbon emissions. In return, Japan can obtain credits to offset its required cutbacks. The agreement between Japan and Russia has other features, too. The two countries will share information on nuclear energy production. (Both have something to offer. Japan is a leading producer of nuclear energy technology, and Russia a leader in the development of breeder reactors.) And Japan will become a larger investor in the search for offshore gas and oil in Russian waters.

This arrangement is facilitated by the fact that Russia has no difficulty in meeting its Kyoto goal, a zero increase in carbon emis-

sions above the 1990 baseline. With the Russian economy in shambles, production has fallen well below 1990 levels. However, Japan, which promised to cut baseline emissions by 6 percent, faces a real challenge. Reducing emissions of carbon there requires costly changes in fuel use.

The Stakes Are High

Political action by bootleggers occurs because there are big gains to be made by positioning oneself more favorably. Economic studies show that the implementation of Kyoto will create winners and losers. Long before Kyoto, academic economists were turning out studies on the effects of controlling greenhouse gases (Manne and Richels 1991; Nordhaus 1991; Pearce and Barbier 1991; Whaley and Wigle 1991; Jorgenson and Wilcoxen 1993; Kosobud et al.1994; Larsen and Shah 1994; Sinclair 1994; Holz-Eakin and Selden 1995; Carrato, Galeotti, and Gallo 1996; Chen 1997).

Perhaps the most comprehensive study was the Jorgenson-Wilcoxen (1993) study, a large model of the United States economy that incorporates thirty-five industrial sectors as well as consumer behavior, investment, and trade. The authors studied what would happen if United States emissions of carbon were held constant at 1990 levels[6] (a less ambitious goal than the cutbacks agreed on at Kyoto) and what fuel taxes would be required to achieve the goal. For example, one of the simulations indicated that coal should be taxed at $11.01 per ton, oil at $2.31 per barrel, and natural gas at $0.28 per thousand cubic feet. The resulting revenues, the authors estimated, would yield $26 billion annually to the federal government.

The authors concluded that the tax policies under consideration would cut annual GDP (gross domestic product) growth by between fractions of a percentage point and one percentage point. While this may not seem dramatic, a change of one-half a percentage point in annual growth from 2.0 percent to 1.5 percent is a 25 percent reduction. It means that the time it will take for total GDP to double (a measure of increasing prosperity) will lengthen from

36 to 48 years. A one percent loss in GDP is not small potatoes, even for one year. If the loss continues for more than a decade in a growing economy, the cumulative loss can equal as much as half of what the GDP was when the cutbacks started. The cost in terms of human well-being could be large.

More striking are the expected changes in energy prices. Jorgenson and Wilcoxen estimate that coal prices would go up by 40 percent and coal production would drop by 26 percent.

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Manne and Richels (1991) took a global approach. They assumed that industrialized countries would seek to reduce carbon emissions by 20 percent by the year 2020 and that developing countries would limit their emissions to twice their 1990 levels. They found that the United States GDP would be 3 percent lower than its baseline by the year 2030, and would continue at a 3 percent lower level from that point to 2100. Mexico and oil-producing countries would sustain even larger losses, and China the largest of all, losing 10 percent of GDP in the last half of the twenty-first century. Losses for the OECD (Organization of Economic Cooperation and Development) countries other than the United States would be much smaller, however, reaching only 1 to 2 percent in 2030. In the most stringent set of circumstances, the price of coal would increase fourfold, and the demand for oil would increase, not decrease.

Other studies reported in professional journals follow the same lines. The academics agree that reducing carbon emissions to 1990 baseline levels places the brunt of the adjustment cost on the coal and coal-related sectors and that the GDP growth rates in the industrial world will be affected. They also indicate that the potential cost of the Kyoto Protocol to the United States is far greater in total and in relative terms than that for other industrialized countries.

As Kyoto approached, these broad studies were supplemented by studies of the proposed protocol's impact on specific sectors. In most cases, these studies were performed by respected consulting firms for trade associations, organized labor, and government.

These studies generally assumed that some permit trading—as opposed to taxation and regulation alone—would be used to implement the treaty. As we have seen, permit trading is attractive because the cost of reducing carbon emissions differs among and within countries. Much of the negotiation now going on relates to the definition and regulation of permit trading.

The specialized industrial studies made a variety of assumptions about the role of permit trading, but generally assumed some trades would be allowed. DRI/McGraw-Hill (1997) prepared a major study for the United Mine Workers and Bituminous Coal Association. The study (reviewed by the Economic Policy Institute) assumes a government-issued marketable permit program. The study considers two scenarios: stabilizing greenhouse gas emissions at 1990 levels and reducing emissions by 10 percent below 1990 levels by the year 2010.

The study predicts a sevenfold price increase for coal by 2010. Electricity prices are expected to double and retail gasoline prices to rise by 40 to 50 percent. Because of these price increases, coal, which now provides 24 percent of U.S. energy, will provide only 18 percent. Petroleum's share will increase, and natural gas will maintain its current market share.

The government's revenue from permit sales will rise to $776 billion in 2020, and yield a budget surplus of $388 billion by 2020. Annual losses in employment will reach 1.4 million for the years 2000–2020, and growth in GDP will be reduced by one percentage point (say, from 2.5 percent to 1.5 percent), as the economy adjusts to the constraints. Coal output is predicted to decline by 45 percent, rubber and plastics by 50 percent, and electricity production by 18 percent.

A study conducted by the economic consulting firm WEFA and sponsored by the American Petroleum Institute is even more pessimistic (WEFA 1998). It assumes that U.S. carbon emissions will stabilize at 1990 levels by the year 2010, but at a high cost.

The analysts assume that emissions, if uncontrolled, would be 27 percent above 1990 levels by 2010, and 46 percent above the target by 2020. They also assume that trade in permits will occur only in the United States. To achieve the necessary reductions, carbon permit prices would have to rise across the control period from $100 per ton/per year to $300 per ton per year of emissions. Companies that want the right to emit carbon dioxide may have to buy those rights from companies that can cut back.

The carbon reductions would lead to a 30 to 55 percent increase in overall consumer prices, with energy-intensive sectors sustaining shocks comparable to those associated with the Arab oil embargoes of the 1970s. Under WEFA's scenario, U.S. exports will become "relatively more expensive on the world market, while the prices of many imported products will fall." Exports will go down, and imports rise (WEFA 1998, 4-5).

The report noted that chemicals, paper, textiles and apparel, and computer and electronic parts production would be severely affected. By 2010, real GDP would be 2.4 percent lower than otherwise.

The carbon reductions would lead to a 30 to 55 percent increase in overall consumer prices.

Ronald J. Sutherland, senior economist for the American Petroleum Institute, prepared an interesting analysis of Kyoto policy options.[7] Using an elegantly simple econometric model for explaining carbon emissions, Sutherland showed that it is practically impossible for the U.S. to achieve Kyoto's goals, especially if nuclear energy production is ultimately replaced by gas-fired turbines, as is now expected.

Sutherland also contends that the price increases necessary for achieving Kyoto goals will not be accepted. Based on estimates of price elasticity of demand from ten large-scale studies, gasoline prices would need to rise from $1.25 per gallon now to $4.23 per

gallon in 2010, just to achieve Kyoto levels. The target date for achieving the goal comes too soon to make the increase more bearable and, in Sutherland's view, the full effects will arouse too much opposition to be enacted (Sutherland 1998).

There are other notable studies, but these reports identify the strategic issues. The complexity of the issues sometimes led to varying interpretations of the same data. For example, the U.S. Department of Energy (DOE) studied Kyoto effects (Office of Policy and International Affairs 1997). It assumed a goal of achieving 1990 emission levels by 2010. It found that if the market for

The complexity of the issues sometimes led to varying interpretations of the same data.

tradeable permits is strictly domestic, permit prices will rise to $150 per ton of carbon emissions during the control period. The price of United States coal will triple, and consumption of coal will fall by 50 percent by 2010. Total GDP losses generated by the controls will reach $418 billion. With a world market in permits, however, the price of permits would be only $40 per ton, the department estimated. The relative magnitudes of costs varied significantly across different scenarios about timing and permit prices assumed by the DOE analysts.

In another DOE study prepared by the Interlaboratory Working Group on Energy-Efficient and Low-Carbon Technologies (1997), the analysts found the effects of meeting Kyoto's constraint would hardly be felt. When the scientific journal *Nature* reported this good news, it indicated there would be "no net cost in cutting carbon emissions." The reason: The DOE study argued that if the federal government invested "far beyond current efforts" to encourage switching to energy-efficient technologies, payments for fuel would go down by between $50 and $90 billion per year. These savings, *Nature* said, would be enough to offset the costs of switching (Reichhardt 1997, 429). Unfortunately, when calculating costs

and benefits, the DOE study did not account for the cost of government efforts to bring about the amazing changes.

In the face of multiple studies indicating that implementation of Kyoto will impose substantial economic costs on the U.S. economy, Janet Yellen (1998), Chairperson of the Council of Economic Advisers, offered a more optimistic outlook. But Yellen's more sanguine view was based on the assumptions that the United States would purchase emission credits from a host of developing countries, that global technology transfers would induce "clean economic development" yielding U.S. emission credits, and that carbon sinks developed by improved forestry practices would cheaply offset carbon emissions. With all these forces working favorably, her calculations indicated that the cost of Kyoto would fall from $240 per ton of carbon reduced to just $23. Yellen indicated that her estimates were not based on a single model but were derived by applying different assumptions to existing econometric models. With world trade in emission credits working away, Kyoto would not interfere with U.S. economic growth and prosperity, she indicated.

In spite of differences in emphasis and wide-ranging estimates of overall effects, the larger studies are consistent in arguing that energy-intensive sectors of the economy will face high costs, and that coal production will carry the brunt of the load. It is also clear that substitutes for coal such as natural gas and oil have much to gain.

POLITICAL JOCKEYING

The potential cost of the Kyoto Protocol to the United States is far greater than for other industrialized countries, even if trading is allowed. A number of major European countries have already reduced their use of coal. Others, like France, depend largely on nuclear energy, which produces no carbon emissions but leaves the country facing the challenge of reducing auto emissions.

Yet the prospect of having the United States reduce its costs by buying overseas permits is more than some international politi-

cians can bear. British Deputy Prime Minister John Prescott, for one, wants to make certain that the United States feels the pain of implementing the Kyoto accord. Prescott expressed concern that Washington would "buy tradable greenhouse emission permits from Russia." As he put it, "Europe has always been clear that while we accept the trading possibilities in this matter, they should not be used as a reason for avoiding taking action in your own country" (Raven 1998).

The prospect of having the United States reduce its costs by buying overseas permits is more than some international politicians can bear.

United Kingdom negotiators oppose an international market in carbon emission offsets generally, and also oppose trades that allow two countries to increase their emissions. John Prescott's idea of trade requires that one party must always reduce emissions if another party increases them.

Yet, as we have seen, some countries' emissions are already approaching their target levels. Under some proposed trading plans they would have little difficulty in selling their rights to carbon emissions. With Russia's carbon emissions 30 percent below the country's target level of zero reduction, Russia could sell emission credits to another country (such as the U.S.) and both countries could increase emissions. To many economists, the fact that under some circumstances both countries can increase emissions is one of the beauties of a permit marketing scheme.

Even as the European Union (EU) tries to limit gains from trade for the United States, it has come up with a way by which its member states hope to minimize their emission reduction costs. The European Union will use a "bubble" concept to achieve overall emission reductions for the member states. A bubble is a way of measuring the success of a group of emitters by focusing on their overall collective action—what is emitted from the bubble, not the action taken by any one particular emitter. Under this plan, some

countries will be able to emit more and others less because only the collective total matters.

The bubble allows the European Union to minimize the overall cost of emission reductions by allocating emission cutbacks differently to different countries. It is generally cheaper to reduce emissions when concentrations are higher, so it is logical and technically efficient to require countries that produce more CO_2 per unit of output to make larger cutbacks.

The system obviously provides a framework for trading. Those that face high costs in cutting back their emissions can buy permits or credits from other European countries that face lower control costs.

In its own way, the United States also played the "increase the rivals' cost game."

By encouraging bubble trading within the EU while managing Europe's external trades so that its competitors' costs go up, Europe's new central government takes on the traditional protectionist position of many nation-states, controlling exports and imports. The difference is that the items traded are permits (emission reductions), not commodities.

Not surprisingly, the United States' negotiators didn't like the European bubble when it came up during Kyoto negotiations. In its own way, the United States also played the "increase the rivals' cost game." During the negotiations it pushed for treating each European country, whatever its size, as the equal of the United States. American negotiators argued that each European state should have specific reduction goals that must be met internally, rather than being allowed to trade within Europe under the bubble. Each small country such as Portugal and Greece would have to meet its own Kyoto-specified target. But internal trading within Portugal is a far cry from the internal trading that could go on in the much more vast United States. From the United States' perspective, this arrangement would have been doubly beneficial: The United States

could trade with the less-developed countries of Europe and at the same time impose higher costs on its competitors.

Although jockeying for competitive advantage between Europe and the United States is evident, countries within Europe, too, are strategically positioning themselves. The proposed allocation of emissions under the bubble is shown in the Appendix.

The policy gives more leeway to southern European countries, such as Spain, Portugal, and Greece, lower income countries that are rapidly industrializing and emitting high quantities of carbon. Countries such as the United Kingdom, the Netherlands, and France were already relatively low on carbon emissions, having transformed their coal-based energy economies to cleaner fuels. Through trading, these countries can purchase the emissions credits of the high carbon emitters at relatively low cost.

To gain a better understanding of the European (EU) allocation scheme, I developed a multivariable statistical model that attempted to determine factors explaining the allocation scheme (Yandle n. d.). My modeling efforts showed that newer EU members received more allowances, all else being equal. In addition, less populous countries are allowed to emit more tons of CO_2 per person, which means relative costs are lower where population is smaller. Countries that currently produce higher levels of carbon emissions per unit of GDP received fewer allowances, and higher per capita income was also associated with fewer allowances.

My study of the scheme suggests that the allocations are designed to keep the bootlegger community intact. The bubble minimizes overall costs, as we have seen, and other concessions (what economists sometimes call side payments) are being made to keep reluctant community members (the newer members) from trading outside the community. The study allows one to infer that populous nations that have tighter emissions allowances will probably buy permits from the countries with higher carbon streams and larger allowances for emission growth. Wealth will flow generally from northern to southern European countries for trades within the European bubble.

INTERNATIONAL INDUSTRIAL POLICY

As the post-Kyoto bargaining continues, there are at least two major institutional problems to be settled. The first is the permit markets—how they will be defined and operated and the extent to which this budding market will be unfettered by international rules and regulations.

The second problem is the enforcement of agreements within and among countries that ratify the Kyoto Protocol. In efforts to clamp down on all forms of environmental cheating, ministers from the Group of Seven and Russia met recently to line up cooperation against environmental crime. Britain's John Prescott said that he "wanted to see the equivalent of Interpol to allow police, customs and enforcement agencies to combat . . . global illegal trade" (Morrison 1998, 1).

Singled out for attention was the illegal trade in chlorofluorocarbons, which are greenhouse gases as well as probable sources of ozone depletion. Because the Montreal Protocol of 1988 led to a ban on the manufacture of these chemicals in industrial countries, they have become one of the most widely smuggled items across borders. Perhaps an international environmental police force is in the making.

In any case, a world industrial policy is in the making. In the past, governments such as France and Japan and to a lesser extent the United States engaged in industrial planning within their countries. The idea was to select the industries and firms that potentially would be the engines of the economy and allow the others to phase out gradually. Such industrial policy aimed at improving a nation's economic well-being. It was never effective over the long run but it created opportunities for favor-seeking that gave some industries advantages over the others.

The Kyoto agreement is setting up a system of industrial policy as well, although its purpose is not economic growth. Officials who manage the system will identify winners and losers in the battle over which nations will bear the greater pain of cutting back on carbon emissions. In this international system, as the Baptists work hard to

adopt the treaty, the bootleggers will be converting environmental policy to an industrial policy that favors them.

Conclusion

Day after day, newspapers report the pleas and alarms of the "Baptists" urging world leaders to do something about global warming, but, by and large, the machinations of the "bootleggers" go unnoticed. Yet there is ample evidence that Kyoto is already being used as a crutch to help conventional special interest groups to secure political favors. There is also evidence that some nations and at least one community of nations are acting in strategic ways to enhance their positions relative to other nations.

In the final analysis, we should hope that fear of global warming will subside and that efforts to control the world's energy economies will gradually dissipate because the worry that ignited it will subside. Yet even if this happens, the regulatory concrete delivered by Kyoto will endure. History teaches us that once a major concern becomes transformed into institutional rules, interest groups that invested in those rules will work to maintain them.

In its present form, the Kyoto Protocol is an extraordinarily costly treaty for the U.S. economy, and the United States would do well to reject it. If global warming is an illusion, the treaty will be a waste of time and a misuse of our resources. If global warning turns out to be genuine, those economies that maintain market flexibility will be best equipped to adapt to it. Yet Kyoto's bootleggers are doing everything they can to destroy that flexibility. Either way, we are heading down the wrong road.

Notes

1. For a quick lay summary of the protocol, see Sparber and O'Rourke (1998). For a rendering the complete protocol, see United Nations Framework Convention on Climate Change (1998). A nonbinding resolution (S Res 98) passed the U.S. Senate, 95-0, on

July 25, 1997, requesting the executive branch to sign an agreement only if a commitment is made by developing countries to reduce emissions (Freedman 1997).

2. These data, from Antonelli and Schaefer (1997, 18), were drawn from reports of the Intergovernmental Panel on Climate Change.

3. See Committee to Preserve American Security and Sovereignty (1998).

4. The theories here are discussed more completely in Yandle (1989). The public interest and capture theories are not associated with particular researchers. The economic theory was developed by Stigler (1971) and extended by Posner (1974) and Peltzman (1976). The bootlegger-and-Baptist theory first appeared in Yandle (1983).

5. ADM has received $7 billion in the last sixteen years (Bandow 1997).

6. As it turns out, they incorrectly assumed that a 14.4 percent reduction in year-2020 emissions would achieve 1990 levels. Recent data indicate reductions in the range of 40 percent are necessary.

7. The Sutherland (1998) study is noteworthy for drawing an unusual amount of information from a simple economic relationship.

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APPENDIX

EU Member State Emission Reduction Goals: 1990-2010

Country	% Change from 1990 Levels
Luxembourg	-28.0
Denmark	-21.0
Germany	-21.0
Austria	-13.0
United Kingdom	-12.5
Belgium	-7.5
Italy	-6.5
Netherlands	-6.0
France	0.0
Finland	0.0
Sweden	+4.0
Ireland	+13.0
Spain	+15.0
Greece	+25.0
Portugal	+27.0

Source: Friends of Earth (1998).