"Multi-Pollutant" Regulation of Carbon Dioxide: Shrewd Politics, Bad Policy

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Executive Summary

Although President Bush nixed any chance of the United States ratifying the Kyoto Protocol during his term of office, the Kyoto agenda of climate alarmism and energy rationing continues to shape public debate and action at all levels of government.

Senator James Jeffords' (I-VT) "Clean Power Act" (S.556) and Representative Henry Waxman's (D-CA) "Clean Smokestack Act" (H.R. 1256) are the Kyoto agenda's cutting edge in the 107th Congress. These bills would require substantial reductions in power plant emissions of nitrogen oxides (NO_X), sulfur dioxide (SO_2), mercury, and carbon dioxide (CO_2), the principal "greenhouse" gas targeted by the Kyoto Protocol.

This paper examines some of the scientific, economic, and political issues raised by "Multi-Pollutant" legislation, also described by proponents as "comprehensive, integrated air quality management." Several key conclusions emerge:

The Jeffords-Waxman bills are based on a false premise – that we must reduce fossil energy use to reduce air pollution.

- During the 30-year period from 1970 through 2000, total emissions of the six principal ("criteria") pollutants EPA regulates under the Clean Air Act decreased 29 percent, while vehicle miles traveled increased 143 percent, total energy consumption increased 45 percent, and coal consumption increased 106 percent. Automobile and equipment turnover will continue to produce substantial air quality improvement under current regulatory law in the foreseeable future.

"Integrated" air quality management is false advertising.

- CO_2 is neither an "ambient" air pollutant like NO_X and SO_2, nor a "hazardous" air pollutant like mercury. It does not foul the air, impair visibility, contribute to respiratory disease, or bio-accumulate as a toxin in fish. Putting CO_2 in the same regulatory pot with noxious substances makes for an arbitrary hodge-podge, not an "integrated" strategy. However, mixing up climate policy with pollution control is shrewd politics. Any stand-alone CO_2 bill would be instantly tagged as a Son-of-Kyoto ploy and shunned by most members of Congress.

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[1] This paper is adapted from an earlier essay published by the American Legislative Exchange Council. I would like to thank ALEC for giving me permission to revise and expand the original paper.

As air quality management, "4-Pollutant" bills are horrendously wasteful.

- It costs billions more to reduce air pollution as a "co-benefit" of CO_2 reductions than to control air pollution directly. An Energy Information Administration (EIA) study makes this clear. Reducing NO_X and SO_2 emissions 75 percent below 1997 levels by 2005 would cost $6 billion. Reducing CO_2 emissions 7 percent below 1990 levels by 2005 would cost $77 billion. If the three requirements are "integrated," the total cost is $77 billion – $5 billion less than the sum of their separate costs. That $5 billion "savings" is due to the "co-benefits" of "integration" – the fact that CO_2 reductions entail ancillary NO_X and SO_2 reductions, and vice versa. But, if your goal is cleaner air, then you haven't saved any money at all. Rather, you have spent $77 billion to achieve $6 billion worth of SO_2 and NO_X reductions. In other words, you have wasted $71 billion.

As climate change policy, "4-Pollutant" bills are totally useless.

- According to the world's most advanced climate model, full implementation of the Kyoto Protocol would avoid only 14/100ths of a degree C of global warming by 2100 – probably too small an amount for scientists to detect. Since the United States produces 25 percent of the world's greenhouse gases, U.S. compliance with Kyoto would offset global warming by a hypothetical 35/1000ths of a degree C. The Jeffords-Waxman caps would cut annual CO_2 emissions by 217 million metric tons in 2010 – roughly 39 percent of the America's annual Kyoto reduction target. Hence, those caps would avert 13/1000ths of a degree C of warming by 2100. This infinitesimal change would not benefit people or the planet one whit.

The Jeffords-Waxman bills would limit U.S. fuel options, squander billions of dollars, and harm consumers.

- The EIA analyzed the impacts of both Jeffords' "4-P" caps and Senator Bob Smith's (R-NH) "3-P" caps requiring power plants to reduce SO_2, NO_X, and mercury emissions from 50- to 75-percent. Whereas Jeffords' caps would increase consumer electricity prices 33 percent in 2020, Smith's would raise prices between 1 and 6 percent. Whereas Jeffords' caps would increase power companies' cumulative production costs $177 billion by 2020, Smith's would increase such costs between $28 and $89 billion. Whereas Jeffords' caps' would reduce coal-fired generation 55 percent by 2020, Smith's caps would reduce coal generation between 4 and 10 percent. When Jeffords' caps are fully implemented in 2007, GDP declines nearly $100 billion.

I. Introduction

Although President Bush effectively nixed any chance of the United States ratifying the Kyoto Protocol during his term of office,[2] the broader Kyoto agenda of climate alarmism and energy rationing continues to shape public debate and action, at all levels of government:

- Japan and the 15-member European Union have ratified the Protocol.[3]
- The Bush Administration recently published an alarmist global warming report,[4] refuses to withdraw the United States as a Kyoto signatory country,[5] and plans to offer Kyoto credits to companies that reduce their CO_2 emissions.[6]
- H.R. 4, the Senate energy bill, contains numerous Kyoto-inspired provisions.
- A dozen U.S. States are passing or debating legislation and regulations to cut CO_2 emissions within their own borders.[7]

In the 107th Congress, Senator James Jeffords' (I-VT) "Clean Power Act" (S.556) and Representative Henry Waxman's (D-CA) "Clean Smokestack Act" (H.R. 1256) are the Kyoto agenda's cutting edge. These bills would require substantial reductions in power plant emissions of nitrogen oxides (NO_X), sulfur dioxide (SO_2), mercury, and carbon dioxide (CO_2), the principal "greenhouse" gas targeted by the Kyoto Protocol. This paper will challenge the assumptions and ideas on which those bills are based.

II. The Kyoto Agenda

Kyoto proponents view modern industrial society, with its reliance on carbon fuels, as "unsustainable." Carbon fuels – coal and oil primarily, but also natural gas – emit carbon dioxide (CO_2), a "greenhouse" (heat trapping) gas. According to the theory of catastrophic global warming, the buildup of greenhouse gases in the atmosphere will, if not halted in the coming decades, produce drastic increases in global temperature with all manner of disastrous consequences including melting ice caps, floods, droughts, hurricanes, and species extinctions.

The only feasible solution, says Worldwatch Institute, a prestigious environmental think tank, is to shift from a carbon-based economy to a "solar/hydrogen based

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[2] President George W. Bush, Letter to Senators Hagel, Helms, Craig, and Roberts, March 13, 2001, available at http://www.whitehouse.gov/news/releases/2001/03/20010314.html.
[3] "Japan finalizes its Kyoto ratification," *Greenwire*, 6/4/2002.
[4] Myron Ebell, "Bush Must Withdraw Global Warming Report," *Human Events*, June 10, 2002, available at http://www.cei.org/gencon/019,03052.cfm.
[5] Christopher Horner, "Is Bush Playing Treaty Chicken?" *Washington Times*, June 4, 2002, available at http://www.cei.org/gencon/019,03034.cfm.
[6] Marlo Lewis, Jr., "Son of Kyoto Returns – Again," *National Review Online*, April 12, 2002, available at http://www.cei.org/gencon/019,02959.cfm.
[7] "U.S. on sidelines, but states active amid Kyoto debate," *Greenwire*, 6/03/2002.

economy."[8] Similarly, according to Greenpeace, saving the planet will require choosing "a fundamentally new energy direction based on clean renewable energy, like wind or solar power."[9] Former Vice President Al Gore, contemplating the rise in greenhouse gas concentrations, characterized the gasoline-powered automobile as "a mortal threat to the security of every nation that is more deadly than that of any military enemy we are ever again likely to confront."[10] Denis Hayes, chair of the Earth Day Network, which boasts 5,000 affiliated groups in 184 countries, explained the theme of Earth Day 2000 ("New Energy for a New Era") as follows: "Earth Day 2000 will focus on the peril of global warming and the need to accelerate the transition to the solar energy era."[11] Such statements should leave no doubt as to the *political* objective of the Kyoto agenda. It is to suppress and, ultimately, eliminate energy production from fossil fuels. Essential to that project is energy rationing via regulation of CO_2, the chief byproduct of carbon-based fuels.

During the 106th and 107th Congresses, Senator James Jeffords and Representative Henry Waxman, among others, introduced legislation to require electric power plants to reduce emissions of CO_2. These bills would establish a cap-and-trade program for power plant emissions of SO_2, NO_X, mercury, and CO_2 – hence their shorthand description as "four pollutant" or "4-P" bills. President Bush opposes CO_2 regulation and, as an alternative to Waxman-Jeffords, proposes a "3-P" cap-and-trade program for SO_2, NO_X, and mercury. The Senate Environment and Public Works Committee has held three hearings on Senator Jeffords' bill, S. 556, the Clean Power Act, will soon hold a fourth hearing, and may mark up the legislation before the July 4th legislative recess.

This paper will examine some of the scientific, economic, and political issues raised by "multi-pollutant" legislation. It will make the case that:

- Cap-and-trade is problematic, however you slice it (three ways or four)
- "Integrated" air quality management is false advertising
- As air quality management, "4-P" bills are horrendously wasteful
- As climate change policy, "4-P" bills are totally useless
- Science does not support the theory of catastrophic global warming
- The Kyoto Protocol and other carbon rationing schemes are on a collision course with the energy imperatives of the global economy, and, hence, are unsustainable
- The Jeffords-Waxman bills would limit U.S. fuel options, squander billions of dollars, and harm consumers
- The Jeffords-Waxman bills would launch an era of unlimited regulation

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[8] Quoted by Bjorn Lomborg, *The Skeptical Environmentalist: Measuring the Real State of the World* (Cambridge: Cambridge University Press, 2001), p. 258.
[9] Quoted by Lomborg, *The Skeptical Environmentalist,* p. 259.
[10] Albert Gore, Jr., *Earth in the Balance: Ecology and the Human Spirit* (Boston New York London: Houghton Mifflin, 1992), p. 325.
[11] Cited by Robert L. Bradley, *Julian Simon and the Triumph of Energy Sustainability* (Washington, DC: American Legislative Exchange Council, 2000), pp. 20-21.

III. Problems with Cap-and-Trade

Both Senator Jeffords' Clean Power Act and President Bush's Clear Skies initiative would establish "cap-and-trade" programs to reduce air emissions from electric power plants. In a cap-and-trade program, government sets an overall emissions reduction target or "cap" for all companies in a region, issues tradable emission allowances or "credits" in a quantity equal to the cap, and monitors how many tons each company emits to make sure the cap is not exceeded. Companies are free to choose their own emission control strategies, and firms with high pollution abatement costs have the option to satisfy part or all of their obligations by purchasing emission reduction credits from firms with lower abatement costs.

Cap-and-trade programs are, thus, more flexible than traditional, "command-and-control" regulation. Under command-and-control, government sets technology standards that tell power producers how to reduce emissions, and/or sets performance standards that tell producers what emission levels or rates to achieve.[12]

To judge from the ongoing war of words, the only key issue in dispute is whether cap-and-trade should be "4-P" or "3-P," i.e., whether the federal government should, or should not, cap power plant emissions of CO_2. Although the Competitive Enterprise Institute believes CO_2 regulation would be a public policy disaster, CEI also has strong reservations about President Bush's Clear Skies Initiative.

The standard argument for cap-and-trade runs as follows. Emission trading lowers compliance costs, delivering more environmental bang for the buck. Companies facing low abatement costs have an incentive to cut emissions below what their credit allotment allows, because they can sell the surplus credits or bank them for future use. Conversely, companies facing high abatement costs have the option to buy emission credits to supplement their initial allotment. Compared to command-and-control, more reductions are made where costs are low, and fewer made where costs are high. In addition, trading fosters environmental innovation, because firms devising smarter ways to curb emissions free up credits they can sell for a profit.

To back up this theory, proponents repeatedly cite the SO_2 cap-and-trade program established by Title IV of the Clean Air Act. For example, the Bush Administration, in its information package on the Clear Skies Initiative, notes that during Phase I (1995-1999) of the Title IV program, utilities reduced SO_2 emissions 25 percent below the required level, and at two-thirds the cost of a command-and-control strategy.[13] However, closer examination suggests that emission trading had little to do with Title IV's "success," which is largely chimerical anyway.[14]

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[12] Council of Economic Advisors, *Economic Report of the President, February 2002*, p. 223, available at http://w3.access.gpo.gov/eop/index.html.

[13] White House, Executive Summary – The Clear Skies Initiative, available at http://www.whitehouse.gov/news/releases/2002/02/clearskies.html.

[14] Paul Georgia, *Market-Based Chimera: Emissions Trading Fails to Deliver*, Competitive Enterprise Institute, On Point, No. 41, July 6, 1999, available at http://www.cei.org/gencon/004,01639.cfm.

According to economists Anne E. Smith of Charles River Associates, Jeremy Platt of EPRI, and Denny Ellerman of MIT, emission trading was not a big factor in Phase I cost savings. Far more important was simply the elimination of the technology mandate prescribing the use of scrubbers to reduce SO_2 emissions.[15] Another key factor was the Staggers Act of 1980, which deregulated the railroads. Deregulation lowered by more than 50 percent the cost of transporting low-sulfur coal from the West to the East, making it economical for companies to reduce emissions by switching fuels.[16]

Similarly, trading-fostered technology innovation had little to do with the 25 percent "over-compliance" utilities achieved during Phase I. This was largely due to industry efforts to "game" the system. Anticipating the more stringent emission reduction requirements that would go into effect in Phase II (starting in 2000), power producers made larger-than-required early reductions to earn and bank credits they could later use to offset future obligations. Thus, contrary to appearances, the program is not ahead of schedule. The goal of the program – to reduce SO_2 emissions to nine million tons by 2002 – will not be met.[17] As Smith, Platt, and Ellerman explain:

> Due to phase-in and banking provisions, emissions are likely to substantially (and legally) exceed the annual cap starting in 2000. The beginning of Phase II marks the beginning of an era of "undercompliance," as the bank being created by today's "overcompliance" will allow the full force of the Phase II cap to be delayed [until 2005 to 2012].[18]

Proponents also claim cap-and-trade makes regulatory obligations more predictable. Their ideal is an "integrated" program, with the caps for all pollutants set simultaneously, and for the same compliance period, to facilitate comprehensive, long-term compliance planning. But in some key respects – such as how much pollution abatement will cost – cap-and-trade may create more *uncertainty* than either command-and-control or pollution taxes. It is relatively easy for a utility to estimate how much it will cost to install scrubbers at a given number of facilities, or how much it will cost to comply with a pollution tax set at so many dollars per ton. Estimating the cost of reducing pollutant X by Y tons in Z years may be more difficult. As economist William Pizer explains:

> Price controls – in the form of taxes – fix the marginal cost of compliance and lead to uncertain levels of compliance. Meanwhile, quantity controls – in the form

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[15] Anne E. Smith, Jeremy Platt, A. Denny Ellerman, *The Costs of Reducing Utility SO_2 Emissions – Not As Low As You Might Think*, MIT Center for Energy and Environmental Policy Research, Massachussetts Institute of Technology: Cambridge Massachusetts, August 17, 1998, p. 12.
[16] Dallas Burtraw, *Cost Savings Sans Allowance Trades? Evaluating the SO2 Emission Trading Program To Date*, Resources for the Future: Washington, D.C., September 1995, p. 16.
[17] Georgia, *Market-Based Chimera*, pp. 2-3.
[18] Smith, Platt, and Ellerman, *Costs of Reducing Utility SO_2 Emissions*, p. 5.

> of tradable permits or quotas – fix the level of compliance but result in uncertain marginal costs.[19]

Building on Pizer's analysis, economist Ross McKitrick notes that, in the case of CO_2, imposing a pollution tax leads to unpredictable emission reductions, while imposing a cap leads to unpredictable compliance costs: "If we pick a price (carbon tax), we will surely make a 'mistake' in our forecast of the resulting emissions quantity, while if we pick a quantity [carbon cap] we will surely make a mistake in our forecast of the resulting emissions permit price."[20] Because CO_2 poses no direct threat to human health, McKitrick cautions, "the cost of mistakes associated with picking *quantities* are much higher than those associated with picking *prices*."

According to science journalist David Wojick, cap-and-trade schemes in general generate unpredictable compliance costs. At the "facility level," he notes, the electric supply system is "hugely lumpy." Both power plants and their associated pollution control systems are "very large, both in cost and in the time it takes to build them." Investment in new capacity is not smooth or continuous: "One either builds or does not." Such all-or-nothing decisions are difficult to predict, yet they will affect the demand for emission credits under a cap-and-trade program. Electricity demand is itself "lumpy" on anything less than a decade-by-decade basis. Thus, concludes Wojick, cap-and-trade can complicate long-term investment planning:

> Unpredictable growth in demand for electricity, combined with any given set of build decisions, equals an unpredictable future need for allowances. But allowances are capped ahead of time.[21]

In addition to economic uncertainty, cap-and-trade programs can also create legal uncertainty. Emission credits are not property rights. Government may confiscate or devalue them at any time, and without compensating credit holders for the economic losses. The Clean Air Act leaves no ambiguity on this point:

> An allowance allocated under this title is a limited authorization to emit sulfur dioxide in accordance with the provisions of this title. Such allowance does not constitute a property right. Nothing in this title or in any other provision shall be construed to limit the authority of the United States to terminate or limit such authorization.[22]

Credit confiscation is a real risk. In May 2002, Connecticut Governor John Rowland signed into law a bill that would prohibit the state's six oldest power plants from using emission credits to meet new SO_2 standards. The affected companies may

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[19] William A. Pizer, *Prices vs. Quantities Revisited: The Case of Climate Change*, Resources for the Future, Discussion Paper 98-20, October 1997, p. ii.
[20] Ross McKitrick, *What's Wrong with Regulating Carbon Dioxide Emissions?* October 11, 2001, p. 4, available at http://www.cei.org/gencon/014,02191.cfm.
[21] David Wojick, "Guest Commentary: Will It Be Cap, Trade, and Chaos?" *Electricity Daily*, April 29, 2002.
[22] Clean Air Act, Title IV, Section 403(f).

challenge the law in court, since a federal court in April overturned a New York statute taxing SO_2 credit sales as an unconstitutional restriction on interstate commerce.[23] But this just shows that cap-and-trade offers no escape from the uncertainties of regulation-by-litigation. And even if case law ultimately prohibits states from interfering with federal emission trading programs, the federal government will still have the authority "to terminate or limit" such trading. For example, the U.S. Environmental Protection Agency (EPA) is planning to approve rules that would prevent power plants in Southern California from trading NO_X emission credits until at least 2004.[24]

The belief that once lawmakers set "multi-pollutant" caps, power producers' regulatory requirements will be stable for 10 to 15 years, seems a bit naïve. If at any time EPA determines that additional reductions are required to protect public health with an adequate margin of safety, it will seek to tighten the caps. Moreover, no law enacted by one Congress can bind a future Congress. If today's "multi-pollutant" advocates win, what is to stop them from demanding more stringent targets and timetables in the 108th Congress?

Finally, a "3-P" cap-and-trade program is not a politically viable alternative to a "4-P" CO_2 control regime. Senator Jeffords, Representative Waxman, and others are pushing "4-P" legislation partly out of frustration with the existing Clean Air Act. The plain language, structure, and legislative history of the Act provide no authority for CO_2 regulation.[25] Amending the Clean Air Act to include a new climate change mitigation title comparable to the national ambient air quality standards program, the hazardous air pollution program, or the stratospheric ozone protection program, would be a long, difficult, and doubtful enterprise. In contrast, amending a "3-P" law into "4-P" law is relatively simple (the Waxman and Jeffords bills cover the CO_2 requirement in a single sentence).

A corporate constituency for CO_2 regulation already exists,[26] and a "3-P" program would grow that constituency. After all, many actions taken to reduce NO_X, SO_2, and mercury emissions have the incidental effect of reducing CO_2 emissions. Many companies will say, "As long as we are reducing CO_2, we might as well get credit for it." As it happens, the Bush Administration plans to award regulatory credits for "voluntary" CO_2 reductions.[27] Such credits, however, derive their monetary value solely from the

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[23] "New Conn. Law Bars Some SO2 Trading," *Electricity Daily*, May 17, 2002.
[24] "EPA to Block Certain Calif. NO_X Emissions Trades," *Electricity Daily*, May 17, 2002.
[25] Peter Glaser, Testimony, Joint Hearing of the House Science Subcommittee on Energy and Environment and the House Government Reform Subcommittee on Regulatory Affairs, October 6, 1999, available at http://www.house.gov/reform/neg/hearings/100699/glaser.pdf.
[26] Trade associations advocating CO_2 controls on electric power plants include the Clean Energy Group (Conectiv, Consolidated Edison, Inc., Entergy Corporation, Excelon Corporation, KeySpan Corporation, Northeast Utilities, PG&E Corporation, Public Services Enterprise Group, Inc., Sempra Energy), see http://www.cei.org/gencon/004,01639.cfm, and theClean Power Group (Calpine, El Paso, Enron, NiSource, Trigen), see http://www.cei.org/gencon/004,01639.cfm.
[27] Department of Energy, Voluntary Reporting of Greenhouse Gas Emissions, Reductions, and Carbon Sequestration, *Federal Register*/Vol. 67, No. 87, May 6, 2002/Notices. For an assessment, see Marlo Lewis, Jr., *CEI Comments on the Department of Energy's Voluntary Greenhouse Gas Reporting Proposal*, June 5, 2002, available at http://www.cei.org/gencon/027,03046.cfm.

threat or enactment of a cap. Thus, credit holders have an incentive to lobby for a cap. Especially if combined a CO_2 credit program, "3-P" regulation is bound to mutate into "4-P" regulation. President Bush's Clear Skies Initiative is CO_2 regulation on a delayed fuse.

IV. False Advertising

Supporters tout the Jeffords and Waxman "4-P" bills as models of regulatory flexibility and "integrated air quality management." This is partly incorrect and utterly misleading. S. 556 and H.R. 1256 include a "modernization" provision that would require all power plants 30-years-old or older to install the latest pollution control technologies. "In effect," comments Mary Hutzler, Acting Administrator of the Energy Information Administration, "this would likely require all existing coal plants to retrofit with scrubbers and NO_X reduction equipment if they have not done so already, or retire."[28] This provision is command-and-control with a vengeance.

According to Edison Electric Institute, 80 percent of coal-fired units' generating capacity will be 30 years old in 2007, and 92 percent will be 30 years old in 2012. For most coal-fired plants, the modernization requirement would effectively eliminate the option of purchasing emission credits to comply with the caps.[29]

More critically, the Jeffords and Waxman bills would require power plants to reduce emissions of CO_2 to 1990 levels by 2007. But CO_2 has nothing to do with "air quality." Whatever one may believe about the theory of catastrophic global warming, CO_2 is neither an "ambient" air pollutant, like SO_2 and NO_X, nor a "hazardous" air pollutant, like mercury. CO_2 does not foul the air, impair visibility, contribute to respiratory disease, or bio-accumulate as a toxin in fish. Indeed, CO_2 is plant food, and rising concentrations enhance the growth of most trees, crops, and other plant life – an environmental benefit.[30] Science, therefore, offers no clue how to coordinate CO_2 controls with regulatory requirements for bona fide pollutants like NO_X, SO_2, and mercury.

In addition, the health risks of mercury are different in kind from those of NO_X and SO_2. Mercury is a neurotoxin that threatens fetal brain and nerve development if pregnant women eat mercury-contaminated fish. Mercury emissions become hazardous after they are deposited in lakes and streams and accumulate in fish tissues. NO_X and SO_2 are chemicals that can cause or contribute to respiratory illness by being inhaled. Science, therefore, also offers no clue how to coordinate mercury controls with regulatory requirements for NO_X and SO_2. For example, nobody has come up with a health-based

[28] Mary Hutzler, "Testimony on S. 556, The Clean Power Act," Senate Environment and Public Works Committee, November 1, 2001, available at http://www.senate.gov/~epw/Hutzler_1101.htm.
[29] Gerard M. Anderson, Testimony on S. 556, November 15, 2001, available at http://www.senate.gov/~epw/Anderson_1115.htm.
[30] The Center for the Study of Carbon Dioxide and Global Change provides a wealth of scientific information on this topic. See http://www.co2science.org/center.htm.

metric or equivalency ratio whereby mercury reductions could count towards NO_X and SO_2 reductions, or vice versa.

Finally, although NO_X and SO_2 both contribute to acid rain and impair visibility, they do not both contribute to the formation of ground-level ozone (smog). Therefore, it is not even clear that NO_X reductions should count towards SO_2 reductions, or vice versa. In any event, none of the "multi-pollutant" proposals now on the table allows for such "inter-pollutant" trading.[31]

In short, putting NO_X, SO_2, mercury, and CO_2 in the same regulatory pot makes for an arbitrary hodge-podge, not an "integrated" strategy. "Multi-pollutant" really means "multiple bills" packaged as one. "Multi-pollutant" legislation *aggregates* rather than *integrates* emission control requirements.

However, mixing up climate policy with pollution control is shrewd politics. Any stand-alone CO_2 bill would instantly be tagged as a "Son of Kyoto" ploy and shunned by most Members of Congress. But, fold the CO_2 requirement into a regulatory structure targeting three noxious substances, package the resulting mish-mash as "integrated air quality management," and, Voila! The Kyoto connection all but disappears. Next, throw in some regulatory flexibility, and it begins to look like a good deal.

In reality, what Jeffords and Waxman offer is a Faustian bargain. The CO_2 target they propose would eliminate half of all coal-fired electricity generation in the United States.[32] Worse, it would set a legal precedent for deeper and wider assaults on carbon-based fuels, the source of 70 of America's electric power and 84 percent of all U.S. energy. The remaining sections of this paper will elucidate those and other hazards of "multi-pollutant" regulation of CO_2.

V. Carbon suppression is bad air quality management

The cultural context of most environmental policy debates is a mix of gloomy beliefs and scary images that statistician Bjorn Lomborg calls "the Litany of our ever deteriorating environment."[33] It is widely assumed, for example, that our air is becoming more polluted,[34] and will keep getting dirtier until the United States ends its "dependence" on fossil fuels. This belief accounts for at least some of the appeal of "4-P" legislation. It is demonstrably wrong.

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[31] Randall Lutter, *New Clean Air Legislation Should Allow Inter-pollutant Trading*, AEI-Brookings Joint Center for Regulatory Studies, Policy Matters 02-6, January 2002, available at http://www.aei.brookings.org/publications/policy/policy_02_06.asp.

[32] Energy Information Administration, *Analysis of Strategies for Reducing Multiple Emissions from Electric Power Plants with Advanced Technology Scenarios*, October 2001, p. xiv.

[33] Lomborg, *The Skeptical Environmentalist*, p. 3.

[34] In a 1999 poll commissioned by the Foundation for Clean Air Progress, only 22 percent of respondents said air quality was getting better; 61 percent said it was getting worse. *Survey of Air Pollution Perceptions Final Report, September 1999*, available at http://www.cleanairprogress.org/research/perceptions.pdf.

In the 20-year period from 1980 through 1999, air quality improved nationally for all six principal ("criteria") pollutants that EPA regulates under the Clean Air Act. Ambient concentrations fell by the following amounts: lead, 94 percent; carbon monoxide, 57 percent; sulfur dioxide, 50 percent; nitrogen dioxide, 25 percent; ozone, 20 percent. Concentrations of coarse particulate matter (PM_{10}) fell 18 percent during 1990-99. During the 30-year period from 1970 through 2000, total emissions of the six principal pollutants decreased 29 percent.[35] This dramatic progress occurred while U.S. GDP increased 160 percent, U.S. population increased 36 percent, vehicle miles traveled increased 143 percent, total energy consumption increased 45 percent,[36] and coal consumption increased 106 percent.[37] How is this possible?

As air quality analyst Joel Schwartz explains, technological advances are slowly but surely "decoupling" air pollution from energy production.[38] A new car manufactured in 1997 or later emits 98 percent fewer volatile organic compounds (VOCs), 96 percent less carbon monoxide, and 89 percent less NO_X per mile than a new car manufactured before 1975.[39] New natural gas plants in California emit 90 percent less NO_X per kilowatt-hour of electricity than the average California plant. State-of-the-art technologies can reduce NO_X emissions from older coal-fired generators by 35 to 80 percent.[40]

Nor is it the case that we are reaching the limits of environmental quality in a carbon-based economy. As newer vehicles replace older ones, as emission control systems improve, and as regulations already approved but not yet implemented kick in, the average vehicle will become progressively cleaner over the next two decades.

EPA's Mobile 6 program models automobile emission trends over a 40-year period (1990 to 2030). For the 20-year period from 2000 to 2020, EPA projects that:

- NO_X emissions from all vehicles (including trucks and motorcycles) will decline from 3 grams per mile to just over 0.5 grams per mile.

- Emissions of volatile organic compounds (VOCs) from all vehicles will decline from 2.5 grams per to about 0.5 grams per mile.[41]

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[35] EPA, *Latest Findings on National Air Quality: Status and Trends 1999* (Washington, DC, 2000), p. 4, available at http://www.epa.gov/air/aqtrnd99/brochure.pdf.
[36] White House, Executive Summary – Clear Skies Initiative.
[37] Author's calculation based on Energy Information Administration, Table 7.1, Coal Overview, 1949-2000, available at http://www.eia.doe.gov/emeu/aer/txt/tab0701.htm.
[38] Joel Schwartz, *New Study Distorts Health Benefits of Greenhouse Gas Reductions*, RPPI Rapid Response No. 105, August 21, 2001, available at http://www.rppi.org/rr105.html#_edn8.
[39] Joseph Bast and Jay Lehr, *The Increasing Sustainability of Cars, Trucks, and the Internal Combustion Engine*, Heartland Policy Study No. 95, June 22, 2000, p. 27, available at http://www.heartland.org/studies/automobility-ps.htm.
[40] Joel Schwartz, *New Study Distorts Health Benefits*.
[41] Megan Beardsley, U.S. EPA Office of Transportation and Air Quality, *Mobile 6: EPA's Highway Vehicle Emissions Model*, April 4, 2001, available at http://www.epa.gov/otaq/models/mobile6/namfin.pdf.

In other words, smog-forming compounds per vehicle mile traveled (VMT) will decline approximately 80 percent by 2020. Even if VMT increases by 50 percent over this period, aggregate smog-forming emissions still decline by 70 percent. Here's why.

Step 1: Assume year 2000 per-mile emissions = 1 (in arbitrary units)

Step 2: If per-mile emissions decline by 80%, then per-mile emissions in 2020 = 0.2

Step 3: Assume VMT increases by 50% (somewhat more than the California Energy Commission projects for California).[42]

Step 4: Emissions are then 0.2 X 1.5 = 0.3, which means total emissions decline 70% between 2000 and 2020, even with substantial VMT growth.[43]

Equipment turnover will also continue to reduce power plant emissions under existing regulatory law. According to Energy Information Administration projections, NO_X emissions from electricity generators will decrease from more than 6 million tons in 1997 to less than 4.5 million tons in 2020, and SO_2 emissions will drop from about 13 million tons in 1997 to 8.9 million tons in 2020.[44] These projections underestimate actual emission reductions, because EIA did not factor in several pending regulatory actions, such as new State Implementation Plans to control regional haze and fine particles.[45]

For all its inflexibility, traditional regulation at least had the merit of targeting limited resources at specific pollution problems. The Waxman-Jeffords bills would abandon this common-sense approach and attempt to reduce pollution indirectly by suppressing energy use. A more wasteful policy is hard to imagine. It costs billions of dollars more to reduce air pollution as a "co-benefit" of CO_2 reductions than to control air pollution directly.

EIA's analysis makes this clear. Reducing NO_X and SO_2 emissions 75 percent below 1997 levels by 2005 would cost power generators and consumers $6 billion. Reducing CO_2 emissions 7 percent below 1990 levels by 2005 would cost $77 billion. If the three requirements are "integrated," the total cost is $77 billion – $5 billion less than the sum of their individual costs.[46] That $5 billion "savings" is due to the "co-benefits" of "integrated" air quality management – the fact that CO_2 reductions entail ancillary NO_X and SO_2 reductions, and vice versa. But, if your goal is clean air, then you haven't saved any money at all. Rather, you have spent $77 billion to achieve $6 billion worth of SO_2 and NO_X reductions. In other words, you have wasted $71 billion – wealth no longer available to meet other consumer or environmental priorities.

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[42] California Energy Commission, *Base Case Forecast of California Transportation Energy Demand*, December 2001, p. 9, available at http://www.energy.ca.gov/reports/2001-12-19_600-01-019.PDF.
[43] I am indebted to Joel Schwartz for this argument.
[44] Energy Information Administration, *Analysis of Strategies for Reducing Multiple Emissions from Power Plants: Sulfur Dioxide, Nitrogen Oxides, and Carbon Dioxide*, December 2000, p. 9.
[45] Ibid., p. 6.
[46] Ibid., p. xviii.

To put this somewhat differently, reducing NO_X and SO_2 emissions 75 percent below 1997 levels by 2005 would increase consumer electricity prices by 1 to 2 percent in 2010. "Integrating" these requirements with a 1990-7 percent CO_2 cap would increase consumer electricity prices 30 to 43 percent.[47]

The Natural Resources Defense Council's (NRDC's) critique of President Bush's Clear Skies Initiative has made quite a stir. NRDC claims Clear Skies would enact "weaker" emission reduction targets than those already required by the Clean Air Act:

> Compared to current law, the Bush plan allows three times more toxic mercury emissions, 50 percent more sulfur emissions, and hundreds of thousands more tons of smog-forming nitrogen oxides. The administration plan would delay compliance with even these weak standards by up to a decade longer than would be allowed under current law.[48]

To substantiate this criticism, and the various emission reduction estimates on which it is based, NRDC cites only one source: "EPA, Discussion of Multi-Pollutant Strategy, Meeting with Edison Electric (September 18, 2001)." My efforts to find a record of this discussion on EPA's Web site have so far come to naught. But let's assume NRDC's numbers are correct. In that case, the Jeffords-Waxman NO_X and SO_2 targets are *no stronger* than those mandated by the Clean Air Act.

According to NRDC, "business as usual under the Clean Air Act" will reduce NO_X emissions to 1.25 million tons in 2010 and SO_2 emissions to 2 million tons in 2012. By comparison, the Jeffords-Waxman caps will reduce NO_X emissions to 1.66 million tons and SO_2 emissions to 2.25 million tons by 2007. In other words, "business as usual" produces somewhat deeper reductions, albeit over a slightly longer compliance period. The surprising implication of NRDC's analysis is this: the Waxman-Jeffords CO_2 caps do nothing to reduce SO_2 and NO_X emissions below "business as usual." Reducing CO_2 emissions to 1990 levels, although hugely expensive, buys no improvement in ambient air quality.

VI. Science does not support the theory of catastrophic global warming

The rejoinder to the foregoing criticism of carbon suppression as air quality management is, of course, that we must "do something" to save the planet from global warming. But, as Jerry Taylor has shown,[49] all such "Kyoto Lite" proposals are a sheer waste of time and money.

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[47] Ibid., p. xvii.
[48] Natural Resources Defense Council, *Untangling the Accounting Gimmicks in White House Global Warming, Pollution Plans*, available at http://nrdc.org/globalwarming/agwcon.asp.
[49] Jerry Taylor, *Energy Efficiency No Silver Bullet for Global Warming*, Cato Policy Analysis, No. 356, October 20, 1999, p. 12; available at http://www.cato.org/pubs/pas/pa.356.pdf.

The theory of catastrophic global warming rests on computer climate simulations, known as general circulation models (GCMs). According to the world's most advanced model – the National Center for Atmospheric Research's GCM – the Kyoto Protocol, even if faithfully implemented by all industrialized countries, would avoid only 14/100ths of a degree C of global warming by 2100.[50] Let's assume NCAR's model is correct. The United States emits 25 percent of the world's greenhouse gases.[51] Hence, U.S. compliance with Kyoto would reduce global warming by 35/1000ths of a degree C. The Jeffords bill would cut annual CO_2 emissions by 217 million metric tons carbon equivalent (mmtce) in 2010[52] – roughly 39 percent of the America's 558 mmtce annual Kyoto reduction target.[53] Hence, the Jeffords bill would avert about 13/1000ths of a degree C of global warming by 2100. Scientists would be unable to detect this infinitesimal temperature change, and it would not benefit people or the planet one whit.

A deeper problem with the Jeffords and Waxman bills is the shaky scientific foundation on which climate alarmism is based. The world appears to have warmed about 0.6 degrees C (1 degree F) over the past century. However, that is only half the amount projected by the climate models underpinning the Kyoto Protocol.[54] Moreover, about half of that modest warming occurred prior to 1940, whereas nearly 80 percent of the buildup in greenhouse gas concentrations occurred after 1940. This suggests two things. First, most if not all of the pre-1940 warming was due to natural causes, such as changes in solar energy output.[55] Second, since the models overestimate the warming of the past 100 years, they are also likely to overestimate the warming of the next 100 years.

Over the past 20 years, the planet's surface appears to be warming at a rate of 0.17 degrees C per decade – fairly close to model expectations of 0.22 degree C per decade. However, satellite and weather balloon observations of the lower- to mid-troposphere, extending from 1 to 5 miles above the surface, show virtually no warming (0.034 degrees C per decade for satellites and 0.029 degrees C per decade for balloons).[56] The models thus overestimate recent warming in the lower atmosphere by at least a factor of 5. This is significant, because the models assume that the troposphere (where CO_2 is well-mixed) warms faster than the surface.[57] Indeed, according to greenhouse physics, it

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[50] Thomas Wigley, "The Kyoto Protocol: CO2, CH4, and Climate Implications," *Geophysical Research Letter* 25 (1998): 2285-88.
[51] Energy Information Administration, *International Energy Outlook 2001* (Washington, DC: March 2001), p. 69, available at http://www.eia.doe.gov/pub/pdf/international/0484(2001).pdf.
[52]Energy Information Administration, *Analysis of Strategies for Reducing Multiple Emissions from Electric Power Plants with Advanced Technology Scenarios*, October 2001, p. 31.
[53] Energy Information Administration, *International Energy Outlook 2001,* p. 14.
[54] Roy Spencer, "How Do We Know the Temperature of the Earth? Global Warming and Global Temperatures," Bailey, ed., *Earth Report 2000*: *Revisiting the True State of the Planet* (New York: McGraw-Hill, 2000), p. 24.
[55] Lean, J. and D. Rind. "Climate Forcing by Changing Solar Radiation," *Journal of Climate* 11 (1998): 3069-94; Sallie Baliunas, "New Scientific Advances: The Human Impact on Global Climate Change," testimony before the Senate Environment and Public Works Committee, March 13, 2002, available at http://www.senate.gov/~epw/Baliunas_031302.htm.
[56] Lomborg, *The Skeptical Environmentalist*, p. 270.
[57] Spencer, "How Do We Know the Temperature of the Earth?" p. 33.

is the warming troposphere that is supposed to warm the surface. This suggests that the late 20th century surface warming is also mostly due to natural causes.[58]

All the models predict faster warming at the Poles, provoking fears about a possible collapse of the West Antarctic Ice Sheet and, thus, sudden and catastrophic sea level rise. However, a recent study by University of Illinois researchers, featured in *Nature,* shows "a net cooling on the Antarctic continent between 1966 and 2000," with large areas experiencing temperature drops of 1.2 to 2.0 degrees C per decade.[59]

To explain why the models overestimate observed temperature changes, some scientists postulate that microscopic particles known as sulfate aerosols, produced by fossil fuel combustion, reflect incoming solar radiation back into space, thus counteracting or "masking" the underlying climate change. However, a recent study by Stanford University Professor Mark Jacobson casts doubt on the sulfate hypothesis.[60] Jacobson found that one type of aerosol, black carbon, is a powerful warming agent, and "nearly balances" the net cooling effects of other aerosols. This means climate alarmists still do not have a plausible explanation for why observed temperatures are lower than climate model projections.[61]

Is it not possible that the models' description of climate physics and chemistry is incomplete? A recent study by MIT scientist Richard Lindzen and two NASA colleagues suggests this is the case.[62]

According to the models, the direct warming effect of a doubling of CO_2 concentrations above pre-industrial levels would heat the planet only 1 degree C. Predictions of greater warming are based on positive water vapor and cloud feedback effects that have been assumed rather than observed. The basic idea is that the heat energy from CO_2 accelerates evaporation, increasing concentrations of water vapor, the atmosphere's main greenhouse gas. But, where the water vapor accumulates is critical. Bright, watery cumulus clouds reflect sunlight back to space. Thin, icy cirrus clouds trap heat like a blanket. When the earth warms, does cirrus cloud cover expand or contract?

Using satellites to study cloud types over the tropical oceans and compare them to sea surface temperatures, Lindzen and his colleagues found that every 1 degree C increase in sea surface temperatures decreased the ratio of cirrus cloud area to cumulus

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[58] Sallie Baliunas, conversation with the author, June 1, 2002.
[59] Doran, P.T. et al., 2002. "Antarctic Climate cooling and Terrestrial Ecosystem Response." *Nature* advance online publication. Cited by Sallie Baliunas and Willie Soon, "Antarctica is Freezing Cold," TechCentralStation.Com, 1/15/2002.
[60] Mark Z. Jacobson, "Strong radiative heating due to the mixing state of black carbon in atmospheric aerosols," *Nature*, 409: 695-72, February 8, 2001.
[61] Paul Georgia, *Latest Global Warming Report Already Obsolete*, Competitive Enterprise Institute, May 16, 2001, p. 4, available at http://www.cei.org/sections/section17.cfm.
[62] Richard S. Lindzen, Ming-Dah Chou, and Arthur Y. Hou, "Does the Earth Have an Adaptive Infrared Iris?" *Bulletin of the American Meteorological Society*, 82:417-32, March 2001. For a layman-friendly explanation, see Patrick Michaels, "IPCC's Crumbling Foundation," *World Climate Report*, Vol. 6, No. 13, March 19, 2001, available at http://www.greeningearthsociety.org/climate/search/search.htm.

cloud area by about 22 percent. In other words, the Lindzen team found a *negative* water vapor feedback.

When the ocean warms, fewer cirrus clouds form, more heat escapes to space, and the ocean cools back down. This negative feedback effect "would more than cancel all the positive feedbacks in the more sensitive climate models," and "cancel [positive] water vapor feedback in almost all models." The Lindzen team refers to this newly discovered mechanism as an "adaptive infrared iris," since it responds to changes in surface temperature in a manner similar to the way the eye opens and closes in response to changing levels of light. When the models are run with the iris effect, the range of projected global warming decreases from 1.7-4.2 degrees C to 0.64-1.6 degrees C.

A 0.64-1.6 degree C increase in average global temperature over the course of a century would undoubtedly have regional impacts on ecosystems, agriculture, and industry. Some impacts would be positive, such as improved agricultural productivity in mid-latitude countries.[63] In any event, no balanced assessment would describe such a change as a potential disaster, much less as a "crisis."

As for the claim that manmade CO_2 is destabilizing global climate, the IPCC's *Second Assessment Report*, published in 1995, found no historical support for this theory: "Overall, there is no evidence that extreme weather events, or climate variability, has increased, in a global sense, through the 20th century, although data and analyses are poor and not comprehensive."[64] Similarly, IPCC's *Third Assessment Report*, published in 2001, found "no compelling evidence to indicate that the characteristics of tropical and extratropical storms have changed."[65] Some research suggests that the number of hurricanes striking the United States, and maximum wind velocities in Atlantic and Caribbean Basin storms, have declined in recent decades.[66]

The IPCC's *Second Assessment Report* predicted the earth would warm between 1 and 3.5 degrees C by 2100, with a "best estimate" of 2 degrees C. In contrast, the IPPC's *Third Assessment Report* projects temperature increases ranging from 1.4 to 5.8 degrees C. However, the new (and scarier) temperature estimates are not based on new scientific

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[63] IPCC, *Climate Change 2001: Impacts, Adaptation, and Vulnerability, Technical Summary*, p. 32, and Robert O. Mendlesohn, *The Greening of Global Warming* (Washington, DC: AEI Studies on Global Environment Policy, 1999). Also see Thomas Gale Moore, *Climate of Fear: Why We Shouldn't Worry About Global Warming* (Washington, DC: Cato Institute Books, 1998).

[64] IPCC, *Climate Change 1995 – The Science of Climate Change. Report of IPCC Working Group I* (Cambridge: Cambridge University Press, 1996), p.173.

[65] IPCC, *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2000), Technical Summary, p. 33.

[66] Landsea, Christopher W., Neville Nicholls, William M. Gray and Lixion Avila, 1996 "Downward trends in the frequency of intense Atlantic hurricanes during the past five decades," *Geophysical Research Letters* 23:1,697-1,700; Landsea, Christopher W., Roger A Pielke Jr. Alberto M. Mestas-Nunez and John A. Knaff, 1999, "Atlantic basin hurricanes: indices of climatic changes," *Climate Change* 42(1): 89-129; Patrick J. Michaels, "Global Warming," *Cato Handbook for Congress: 107th Congress* (Washington, DC.: Cato Institute Press, 2001), p. 505.

information, but on new assumptions about aerosol levels, population and economic growth, and energy consumption over the next 100 years.

To arrive at a warming of 5.8 degrees C, the IPCC had to assume that global GDP increases 790 percent by 2050 and 2,519 percent by 2100. At the 2050 midpoint, global temperatures rise by 2.6 degrees C.[67] This doomsday scenario is quite bizarre. IPCC believes that any warming of 5 degrees C or more would be a planetary disaster. A warming of that magnitude, according to the IPCC, would produce frequent and severe floods, droughts, heat waves, tornadoes, and hurricanes; raise sea levels by almost three feet; expand the range of disease-bearing mosquitoes; and increase ground-level ozone (smog) by 75 percent.[68] Yet, the scenario assumes that mankind does not merely prosper in the 21st century but expands economic output more than 25-fold!

Are we to infer that people will be so busy making money they won't notice the hurricanes, floods, heat waves, air pollution, malaria outbreaks, etc.? What would the headlines say on New Year's Eve 2100 – "World to end tomorrow, Dow hits all time high"? The IPCC's doomsday scenario implies that even if the world of the future resembles a combination of the movies "Blade Runner" and "Water World," it will have little or no effect on consumer and investor confidence. There will be no important "negative feedback effects" on economic growth. Paradoxically, the doomsday scenario implies that wealth and the resilience wealth provides are all the planet insurance mankind will ever need!

The doomsday scenario is bizarre in another respect. It assumes that, from 2050 onward, after the world has already warmed 2.6 degrees C, people take no corrective action. Although more than seven times wealthier than we are, the people of that generation supposedly do not invest a dime in global warming mitigation.

Thus, to put any credence in the doomsday scenario, one must affirm either that even the most extreme warming will have little effect on economic activity, or that future generations will implement no mid-course corrections no matter how bad things get.[69]

Claims that CO_2 emissions are causing, or likely to cause, a climate catastrophe are not supported by real-world evidence. At the very least, science is a long way from establishing the need for interceptive regulation. Indeed, the very same computer models on which warming predictions are based show that the world's governments can wait another two decades to take action with no discernible difference in climate outcomes. According to a study by three climate modelers who support Kyoto-style policies, delaying action until 2020 would yield only 0.2 degrees C additional warming in 2100.[70]

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[67] IPCC estimates global GDP grows from $21 trillion in 1990 to $187 trillion in 2050 and $550 trillion in 2100. IPCC, *Climate Change 2001: Impacts, Adaptation, and Vulnerability,* Technical Summary, p. 27.
[68] The IPCC's 5.8 degree C warming scenario projects ground level ozone to increase from 40 to 70 parts per million by 2100.
[69] Kenneth Green, *Mopping Up the Leak: Setting the Record Straight on the "New" Findings of the Intergovernmental Panel on Climate Change*, E-brief 105, Reason Public Policy Institute, October 2000.
[70] T.M.L. Wigley, R. Richels, and J.A. Edmonds, "Economic and environmental choices in the stabilization of atmospheric CO2 concentrations," *Nature,* 379, January 18, 1996, pp. 241, 243.

VII. The Kyoto Protocol and other carbon-suppression schemes are on a collision course with the energy imperatives of the global economy, and, hence, are unsustainable

Confronted with the fact that the Kyoto Protocol would do next to nothing to slow the assumed increase in global temperatures, proponents are quick to reply that Kyoto is just the beginning, the first in a series of global warming treaties, each embracing more countries and/or imposing stricter emission limits. For example, federal climatologist Jerry Mahlman told *Science* magazine in December 1997 that "it might take another thirty Kyotos over the next century"[71] to avert harmful climate change. But in thus unveiling the larger Kyoto agenda, proponents only make clearer why the world should not start down this path in the first place.

According to the Energy Information Administration, meeting Kyoto's emissions reduction target for the United States (7 percent below 1990 levels) would reduce U.S. GDP between $61 billion and $397 billion in 2010, depending on the extent of international emissions trading and the type of tax policy chosen to offset the impacts of higher energy prices on consumer spending.[72] Bjorn Lomborg, using OECD analysis, estimates that continuing compliance with the Protocol's emissions reduction target would cost OECD countries more than $900 billion annually by 2050. He explains: "…since the CO_2 emissions of the OECD countries would otherwise have continuously increased, keeping the Kyoto promise and staying 5.2 percent below 1990 levels will really mean making deeper and deeper cuts, such that in 2050 the entire OECD must have cut its 'natural' emissions by more than 50 percent." And yet, all the cumulative trillions of dollars spent would only postpone by six years the arrival of a 2 degree C increase in global temperatures.[73] There is no way people living in free societies would tolerate such colossal costs for such miniscule benefits.

The main reason Kyoto would not stop human-induced climate change, even if the science underpinning it were correct, is that it exempts developing countries, including high-growth industrial powerhouses like China, from binding emission limits. China alone, for example, is expected to equal the United States as an emitter of greenhouse gases by 2020.[74] Many U.S. leaders decry the developing country exemption as unfair. However, all efforts by Clinton-Gore negotiators to modify it failed. Countries where millions of people live without electric power, automobiles, refrigeration, air conditioning, and basic sanitation are in no position – politically, economically, or morally – to begin limiting their use of energy.

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[71] Quoted by David Malokoff, "Climate Change: Thirty Kyotos Needed to Control Warming," *Science*, December 19, 1997.

[72] Statement of Jay Hakes, Administrator, Energy Information Administration, Senate Energy and Natural Resources Committee, March 25, 1999, p. 10, available at http://www.eia.doe.gov/neic/speeches/sentest325/testv7.html.

[73] Lomborg, *The Skeptical Environmentalist*, pp. 302-305.

[74] Energy Information Administration, *China: Environmental Issues*, April 2001, available at http://www.eia.doe.gov/emeu/cabs/chinaenv.html.

The Kyoto agenda is an attempt to suppress and, ultimately, eliminate energy production from carbon fuels. Market forces are already reducing the carbon intensity (the amount of CO_2 emitted per dollar of GDP) of the U.S. economy. U.S. carbon intensity decreased by 17.4 percent in the decade from 1990 to 2000,[75] and is expected to continue decreasing at a rate of 1.4 percent annually from 1999 to 2020.[76] Economist Jesse Ausubel argues that "decarbonization" is the long-term "business-as-usual" trend of the global economy. "Considering primary sources of energy," Ausubel observes, "we find that coal replaced wood and hay, and oil in turn beat coal for the lead position in the power game. Now natural gas is overtaking coal."[77] Each fuel in this sequence has a higher ratio of hydrogen to carbon atoms than its predecessor. Wood's H:C ratio is 1 to 10; coal's, about 1 to 2; oil's, 2 to 1; and natural gas, 4 to 1.[78] If this trend continues for another century, Ausubel speculates, hydrogen (or some other non-carbon fuel) will be the dominant primary energy source. In other words, market forces will eventually solve the global warming problem – if, in fact, it is a problem.[79]

However, in the foreseeable future (the next 20 years), carbon-based fuels will become more important, not less, in meeting the world's energy and economic needs. For example, the OECD-affiliated International Energy Agency projects world energy demand to grow by 65 percent between 1995 and 2020, with fossil fuels expected to meet 95 percent of the additional demand, and with CO_2 emissions increasing by 70 percent.[80]

The U.S. Energy Information Administration projects similar increases. World energy consumption is projected to rise by 60 percent between 1999 and 2020, with huge increases in demand for coal, oil, and natural gas.[81] For example, world oil demand is projected to increase from 76.0 million barrels per day in 2000 to 118.9 million barrels per day in 2020.[82] Worldwide, CO_2 emissions are expected to rise from 6.1 billion metric tons carbon equivalent in 1999 to 7.9 billion in 2010 and 9.9 billion metric tons by 2020,[83] exceeding 1990 levels (5.8 billion metric tons[84]) by 38 percent in 2010 and by 70 percent in 2020.[85]

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[75] NRDC, *Untangling the Accounting Gimmicks*.
[76] Energy Information Administration, *International Energy Outlook 2002* (Washington, DC: March 2002) p. 163, available at http://eia.doe.gov/oiaf/ieo/pdf/0484 (2002).pdf.
[77] Jesse Ausubel, "Some Ways to Lessen Worries about Climate Change," *The Electricity Journal*, January/February 2001, p. 27.
[78] Jesse Ausubel, "Does Energy Policy Matter?" April 18, 2002, available at http://www.marshall.org/AusubelRTweb.htm.
[79] Of course, all long-term energy scenarios are fanciful, including those on which the IPCC bases its global warming projections. The only safe bet about the energy economy of 2100 is that it will be more different from ours than ours is from the era of the horse and buggy and the steam locomotive.
[80] International Energy Agency, *World Energy Outlook 1998*, press release, Buenos Aires, 10 November 1998, available at http://www.iea.org/pubs/studies/files/weo/weo.htm.
[81] Energy Information Administration, *International Energy Outlook 2002*, p. 1.
[82] Energy Information Administration, *Annual Energy Outlook 2002* (Washington, D.C.: December 2001), pp. 2-3.
[83] Energy Information Administration, *International Energy Outlook 2002*, p. 5.
[84] Energy Information Administration, *International Energy Issues 2000*, available at http://www.eia.doe.gov/oiaf/archive/ieo00/environmental.html.
[85] Author's calculation.

Much of the increase will occur in developing countries, where emissions are projected to grow by an average of 3.6 percent per year between 1999 and 2020. Developing countries alone account for 77 percent of the increment between 1990 and 2010 and 72 percent between 1990 and 2020.[86]

CO_2 emissions in industrialized countries will also grow rapidly, exceeding 1990 levels by 27 percent in 2010 and by almost 42 percent in 2020.[87] Interestingly, about half the expected increment will come from increased consumption of natural gas, as power companies increasingly turn to natural gas for new electric power generation. Worldwide, CO_2 emissions from natural gas use are expected to increase 1.4 billion metric tons above 1990 levels in 2020, compared to a 0.7 billion metric ton increase from coal.[88] One thing these projections make clear is that stabilizing atmospheric CO_2 levels cannot be accomplished just by hammering coal. Natural gas must also be suppressed.

Nor should it be supposed that we could achieve massive CO_2 reductions just by learning to use energy more "efficiently." The foregoing projections already assume significant declines in the energy intensity of the U.S. and world economies. Between 1999 and 2020, energy intensity (the ratio between energy consumption and economic output) is expected to decline by 1.3 percent annually in industrialized countries and 1.2 percent annually in developing countries.[89]

Finally, the Kyoto-preferred fuels – wind, solar, and geothermal – will supply only a tiny fraction of the world's energy needs in the foreseeable future. This is not because of "market failures" or oil company conspiracies but the superior performance of conventional energy sources. Despite tens of billions of dollars in taxpayer and ratepayer subsidies since the 1970s, renewable energy technologies supply only 2.21 percent of total U.S. electric power. Wind provides just 0.13 percent of total U.S. electricity, while solar provides only 0.02 percent.[90] Electricity produced from wind power is expected to grow from 5 billion kilowatt-hours in 2000 to 24 billion kilowatt-hours in 2020 – an almost fivefold increase. However, wind will still contribute less than 1 percent of total U.S. electricity in 2020. What is more, projected growth in wind-generated electricity is due mainly to state mandates and political decisions, not to the overall performance of wind-energy systems.[91]

Clearly, the Kyoto project to restructure U.S. and world energy markets is impossible given current and foreseeable economic and technological realities. The pursuit of that agenda would prove extremely costly, indeed ruinous – and yet would fail to affect global climate. Prudence counsels us not to try to do undoable things. Ethics

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[86] Energy Information Administration, *International Energy Outlook 2002*, p. 13.
[87] Author's calculation based on Energy Information Administration, *International Energy Outlook 2001*, p. 13.
[88] Energy Information Administration, *International Energy Outlook 2001*, p. 13.
[89] Energy Information Administration, *International Energy Outlook 2002*, p. 6.
[90] Jerry Taylor and Peter VanDoren, *Evaluating the Case for Renewable Energy: Is Government Support Warranted?* Cato Policy Analysis, No. 422, January 10, 2002, available at http://www.cato.org/pubs/pas/policyanalysis.html.
[91] Energy Information Administration, *Annual Energy Outlook 2002*, pp. 79-80.

instructs us not to make promises we cannot keep. Common sense tells us not to begin a journey we will not want to finish.

VIII. The Jeffords-Waxman bills would limit U.S. fuel options, squander billions of dollars, and harm consumers

The Energy Information Administration (EIA) has conducted three studies on proposals to limit multiple emissions from electric power plants since December 2000. In the first study, requested by Representative David McIntosh (R-IN), EIA examined the costs of reducing NO_X and SO_2 emissions 75 percent below 1997 levels by 2008, reducing CO_2 emissions to 1990 levels by 2008, and reducing CO_2 emissions 7 percent below 1990 levels by 2012. EIA found that:

> Imposing a CO_2 emission cap, whether at the 1990 level or 7 percent below the 1990 level and with or without stringent NO_X, SO_2, and mercury emission caps, is expected to have a dramatic impact on coal use in the power sector. For example, when a CO_2 cap set to 7 percent below the 1990 level is assumed, coal consumption for electricity generation in 2020 is expected to be 59 percent below the reference level.[92]

In a second study, requested by Senators Bob Smith (R-NH), George Voinovich (R-OH), and Sam Brownback (R-KS), EIA examined the costs of reducing NO_X emissions 50- to 75-percent below 1997 levels by 2007, reducing SO_2 emissions 50- to 75-percent below full implementation of Clean Air Act Title IV requirements by 2007, and reducing mercury emissions 50- to 75-percent below 1999 levels, with half the reductions to be achieved by 2007 and full reductions by 2012. In the third study, requested by Senators James Jeffords and Joseph Lieberman (D-CT), EIA examined the impacts of reducing NO_X emissions 75 percent below 1997 levels by 2007, reducing SO_2 emissions 75 percent below full implementation of Title IV requirements by 2007, reducing mercury emissions 90 percent below 1999 levels by 2007, and reducing CO_2 emissions to 1990 levels by 2007. That is, EIA examined the costs of the emission reduction targets prescribed in the Jeffords and Waxman bills.

These two studies, singly and in combination, yield several key findings.[93]

- The Jeffords-Lieberman-Waxman (JLW) caps would increase consumer electricity prices 31 percent in 2010 and 33 percent in 2020 relative to the reference case. In contrast, the Smith-Voinovich-Brownback (SVB) caps increase electricity prices 1 to 6 percent by 2020.

- CO_2 reductions and the associated cost of carbon emission permits are responsible for most of the projected increase in consumer prices under the JLW caps. The total value of carbon permits in 2010 is about $44 billion,

[92] Ibid., p. 42.
[93] Acting EIA Administrator Mary Hutzler summarizes the three studies in her November 1, 2001 testimony on S. 556. See footnote 28, above.

rising to $58 billion in 2020. In contrast, the total value of all other permits in 2010 is just over $2 billion, falling to under $2 billion by 2020.

- Through 2020, the JLW caps increase cumulative resource costs of electric power generation (how much companies have to spend to generate electricity, excluding emissions permit costs) by $177 billion. In contrast, the SVB caps increase cumulative resource costs by $28 billion to $89 billion.

- The JLW caps reduce coal-fired generation by 962 billion kilowatt-hours in 2010 and by 1,261 billion kilowatt hours in 2020, 43 percent and 55 percent, respectively. In contrast, the SVB caps reduce coal-fired generation 4 to 10 percent by 2020.

- Mercury reductions exhibit sharply rising marginal costs. In 2020, mercury allowances prices rise from $41,190 per pound under a 65 percent reduction requirement, to $85,225 per pound under a 75 percent reduction requirement, to $153,000 per pound under a 90 percent reduction requirement. The cost of removing the last unit of mercury to achieve 90 percent removal exceeds $800,000 per pound.[94]

- When the JLW limits are fully imposed in 2007, GDP declines from 0.4 to 0.8 percent, or nearly $100 billion.

The Jeffords-Waxman bills would thus severely restrict access to coal, America's most abundant fuel source, imposing multi-billion dollar costs on consumers, power producers, and the economy. As already noted, the same air quality gains could be achieved far less expensively without a CO_2 cap. Moreover, the CO_2 cap would have no effect on global climate.

IX. The Jeffords-Waxman bills would launch an era of unlimited regulation

Even though the Kyoto agenda is unaffordable, infeasible, and, therefore, unsustainable, it has the potential to do great harm. The cumulative trillions of dollars required to implement Kyoto are resources Western nations could not use to address more urgent environmental problems, such as indoor air pollution and waterborne diseases, which kill millions of women and children each year in developing countries. Even in a wealthy country like the United States, Kyoto would destroy untold thousands of jobs and squeeze consumers each time they fill up their cars, heat their homes, and turn on the lights.

Unlike Kyoto, the Jeffords-Waxman bills would establish CO_2 controls for only one industry sector. But, if enacted, those bills would set an unequivocal precedent,

[94] Energy Information Administration, *Reducing Emissions of Sulfur Dioxide, Nitrogen Oxides, and Mercury Emissions from Electric Power Plants*, October 2001, p. 15; *Strategies for Reducing Multiple Emissions from Electric Power Plants* (July 2001), p. 27.

giving a green light to further assaults on the energy sources that fuel the American economy.

Because CO_2 is neither an ambient nor a toxic pollutant, there are no air quality or health-based standards for regulating CO_2. Even with respect to climate change, no one knows how much CO_2 in the atmosphere is too much, too little, or just right.[95] Consequently, agencies regulating CO_2 would not be constrained by any objective health or welfare criteria.

That the enactment of *any* CO_2 cap would spawn a succession of more onerous requirements may also be inferred from the nature of fossil fuels. The carbon in coal, oil, and natural gas is not a contaminant but an intrinsic component of their chemistry as fuels. Thus, once government starts restricting fuels based on their carbon content, or activities based on their CO_2 emissions, there is no logical stopping point short of total suppression. And, as we have seen, the avowed goal of many Kyoto supporters is to eliminate the use of fossil fuels.

Not only are there no limits in principle to the regulatory burdens government could place on individual entities under a CO_2 control regime, there are almost no practical limits to the number of entities government could regulate. A recent report by the Pew Center on Climate Change estimates that, in the United States, 10,775 firms emit at least 10,000 metric tons CO_2 per year, and 86,182 U.S. firms emit at least 1,000 metric tons of CO_2 per year.[96] Energy analyst Mark Mills estimates that nearly one million U.S. businesses, including 300,000 manufacturing firms, 400,000 commercial buildings, and 150,000 farms, emit over 100 tons of CO_2 per year.[97] EPA does not currently regulate CO_2, and has no authority to do so.[98] However, the Jeffords-Waxman bills would smash that barrier. If enacted, the Jeffords-Waxman bills would render as many as one million firms vulnerable to new EPA regulation, monitoring, and enforcement.

Conclusion

Kyoto supporters often say that we do not have to choose between a healthy economy and a healthy environment. They are right, but for the wrong reasons. Carbon-based fuels are increasingly abundant, affordable, safe, and clean.[99] Only wealthy societies can afford to invest in high levels of environmental protection, and only free societies can invent the breakthrough technologies of tomorrow. The Kyoto agenda is a prescription for poverty and regulatory excess. Policymakers are well advised to shun it and every initiative that would advance it.

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[95] Fred S. Singer, *The Kyoto Protocol is not Backed by Science*, University of Virginia and Science & Environmental Policy Project, May 2002, p. 6.

[96] Pew Center on Global Climate Change, *Greenhouse Gas Reporting and Disclosure: Key Elements of a Prospective U.S. Program*, In Brief Number 3 (March 2002), p. 6, available at http://www.pewclimate.org/policy/index_ghg.cfm

[97] Mark P. Mills, *A Stunning Regulatory Burden: The EPA Designating CO2 As A Pollutant*, 1998, available at http://www.fossilfuels.org/Climate/burden.htm.

[98] Glaser, Testimony, see footnote 25, above.

[99] Bradley, *Julian Simon and the Triumph of Energy Sustainability*.

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