

A New Clean Air Strategy

by Jan Mazurek

With officials from around the world descending on Montreal, Canada, November 26 through December 9 for a new round of climate change negotiations, the United States has once again taken a position on the sidelines. The Bush administration, which pulled the United States out of the Kyoto Protocol on Global Warming, has signaled that it will remain a holdout rather than make a greater commitment to future negotiations in hopes of addressing legitimate U.S. concerns about the agreement's shortcomings.

Nonetheless, on the home front, political momentum seems to be building for action to bring U.S. greenhouse gas emissions under control. Hurricanes Katrina, Rita, and Wilma blew a fresh sense of urgency into the climate change debate, since researchers have established a clear link between rising sea surface temperatures due to global warming and the increasing violence of tropical storms.¹

Meanwhile, even before hurricane season, cracks were beginning to appear in the Republican Party's unified opposition to reducing greenhouse gas emissions. Ironically, the most dramatic convert was President Bush himself. After years of obfuscation on the subject, he finally crossed the Rubicon at a G-8 summit meeting in Gleneagles, Scotland, last summer, saying: "I recognize that the surface of the Earth is warmer, and that an increase in greenhouse gases caused by humans is contributing to the problem."²

The president's belated concession on the science of global warming followed statements

from scientific academies in 10 nations—including the U.S. National Academy of Sciences—that concluded the Earth is getting warmer and humans are part of the cause. And while the Senate again rejected a measure during this summer's energy debate that would have established a mandatory cap on greenhouse gas emissions, it did pass a resolution calling on Congress to enact an "effective national program of mandatory, market-based limits and incentives on emissions of greenhouse gases."³ Sen. Pete Domenici (R-N.M.), chair of the Senate Committee on Energy and Natural Resources, later opened a series of hearings on legislative options to combat climate change.⁴ He vowed to work with this home-state colleague Sen. Jeff Bingaman (D-N.M.), the ranking minority member on the committee, to build consensus on a policy to address the problem "through market-based limits and incentives that don't harm our economy."⁵

In short, there seems to be growing bipartisan support for serious action to reduce

“One person with a belief is a social power equal to ninety-nine who have only interests.”

—John Stuart Mill

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greenhouse gas emissions. What is needed now is a legislative vehicle that can attract enough support from both parties to break the partisan gridlock that has so far stymied progress against climate change.

Despite the president’s rhetorical epiphany on the science of global warming, he has yet to propose a credible, mandatory plan to slow or reverse the rate at which U.S. companies emit greenhouse gases into the Earth’s atmosphere. The administration’s signature air pollution proposal for utilities, the so-called “Clear Skies” initiative, omits greenhouse gases. Instead, it would only curb power plant emissions of three pollutants implicated in smog, acid rain, and neurological disorders: nitrogen oxides (NO_x), sulfur dioxide (SO₂), and mercury, respectively. To actually slow or reduce greenhouse gas emissions, the administration has proposed only voluntary initiatives.⁶ The measure has failed to win the support of any Democrats, who rightly insist that a mandatory cap on emissions of carbon dioxide (CO₂)—the most prevalent greenhouse gas—is the sine qua non for any credible climate change bill. Clear Skies has failed to make it out of committee for a full vote on the Senate floor.⁷

There is, however, an alternative. Sens. Tom Carper (D-Del.) and Lincoln Chafee (R-R.I.) have introduced the Clear Air Planning Act (CAPA), which adds a carbon cap to the Clear Skies framework. This approach offers the only plausible path to a bipartisan deal that would finally commit the United States to live up to its responsibility to combat climate change.

The bill has yet to attract broad support. Many Democrats have held back from supporting it, calling for even stronger reductions in carbon emissions. However, PPI believes that Democrats cannot afford to make the perfect the enemy of the good. The country needs to make progress on greenhouse gas emissions as soon as possible, and the Carper-Chafee plan could prove to be an invaluable stepping stone to a comprehensive national policy. As a legislative matter, it is also a path that has not yet been tried. Democrats should coalesce around CAPA and challenge GOP moderates to do the same.

Democrats should be aware, however, that this strategy carries a risk: Because CAPA has a framework mechanically similar to Clear Skies, supporters of the president’s plan may be tempted to try a bait and switch maneuver

by supporting CAPA and then stripping its carbon provision at the eleventh hour, weakening its emissions reduction targets and adding in Clean Air Act rollbacks. To avoid that outcome, Democrats should make it clear at the outset that they do not view CAPA as the end, but the beginning of a serious push that will eventually lead to an economy-wide, “cap-and-trade” system for carbon and other greenhouse gas emissions.

The White House, for its part, has argued that the Carper-Chafee approach would boost electricity prices and generally burden the economy, while the president’s preferred approach would produce important environmental gains with much lower costs for industry. But that argument has been weakened substantially by a new Environmental Protection Agency (EPA) report that includes cost-benefit estimates for the Clear Skies and CAPA plans.⁸ Although administration officials have tried to spin the data as demonstrating the superiority of Clear Skies, the actual numbers show that CAPA would produce more environmental bang for the buck than Clear Skies.

It is time for progressives to embrace a new clean air strategy, and challenge liberals, environmental groups, conservatives, and businesses to break today’s climate change deadlock by backing the bipartisan CAPA approach. Instead of reaching first for comprehensive solutions, or blocking any attempt to control carbon, we should start with a more modest, but attainable goal: Limit emissions of a select group of pollutants in the power sector, including CO₂, the most prevalent greenhouse gas. A breakthrough in the power sector will enhance prospects for subsequent action aimed at accomplishing the ultimate climate-change goal—establishing a national, market-based system of mandatory emissions limits for all major greenhouse gases and other especially dangerous environmental pollutants.

Starting with the power sector also makes sense for other reasons. Electricity generators

are responsible for 40 percent of all U.S. CO₂ emissions, and they have experience successfully implementing a market-based system for reducing emissions of pollutants that cause acid rain. Starting with them could help in the development of the policy rules and tools necessary in an economy-wide emissions-control program. It would also allow lawmakers to scale up a national greenhouse gas system that folds in limits on emissions of pollutants that contribute to such problems as smog, acid rain, and neurological disorders. Finally, starting in the power sector could also give lawmakers a chance to observe in practice the costs that a market-based emissions-control regime would place on emissions producers. If those costs rise faster than expected, lawmakers may want to consider designing reasonable economic safeguards into the national regulatory scheme.

In issuing such a challenge, progressives may be able to enlist the aid of environmentally conscious conservatives and, intriguingly, religious organizations that have explicitly taken up the challenge of slowing climate change. Evangelical Protestants—key GOP voters—along with many Catholics and Jews, have begun preaching a “green gospel” that frames issues such as global warming as matters of scriptural conscience. They are not satisfied with the president’s Clear Skies position. They say they want real action on greenhouse gas emissions.⁹

Which Way Forward?

Members of Congress who support mandatory greenhouse gas reduction initiatives that would include carbon dioxide have been determined to press forward in the face of stubborn White House opposition. In addition to the Carper-Chafee proposal, there are at least two other important proposals that are different from each other, but could ultimately fit together to form a comprehensive national system of emissions limits for greenhouse gases

and dangerous environmental pollutants. The McCain-Lieberman bill, the Climate Stewardship and Innovation Act (CSIA), would establish an absolute, economy-wide cap on emissions of all six major greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). It would require emissions of those gases in all sectors of the economy to return to their 2000 levels, beginning in 2010.

The McCain-Lieberman proposal and the Carper-Chafee proposal are both cap-and-trade plans. That is, in addition to placing caps on allowable emissions (a fixed cap for the whole U.S. economy in the McCain-Lieberman proposal and a cap just for power-sector emissions in the Carper-Chafee plan), the government would sell or give “allowances” to emitters that they could hold or trade with other emitters—or with farmers and foresters whose crops absorb carbon dioxide that would otherwise end up in the Earth’s atmosphere. Companies that are able to keep their emissions below an allowable limit would be able to sell credits to companies that emit more than their caps. Those that exceed their limits would have the choice of either buying emissions credits from more environmentally efficient companies or paying fines. This approach has proven wildly successful in the fight against sulfur dioxide pollutants from power plants that cause acid rain. This market-based approach focuses on the outcome—the desired level of economy-wide or sector-wide emissions—instead of mandating specific technologies or practices industries must use to meet that target.

Cap-and-trade systems are highly efficient, cost-effective strategies to reduce emissions, as the case of EPA’s acid rain trading program for power plants. But any system of mandatory emissions controls will have costs. Since an emissions credit trading market assigns a value to an activity that was once free (emitting carbon dioxide and other greenhouse gases), emitters are likely to pass some of their costs on to

consumers. For example, researchers at MIT estimate that if the emissions cap envisioned in the McCain-Lieberman bill were to take effect in 2010, as they have proposed, it would cost U.S. households about \$15 per year in higher gasoline and heating costs. To offset the higher home heating bills that a cap-and-trade system could produce, the government could sell some or all of the emissions credits and funnel the revenues to low-income households.

Skeptics of the cap-and-trade approach fear that the market could drive the trading price of allowances so high that companies, unable to control their emissions quickly, would not be able to afford them and be forced out of business. To avoid that problem, Sen. Bingaman plans to propose a third emissions control strategy, possibly with the support of Sen. Domenici. Like the McCain-Lieberman proposal, Bingaman’s plan would cover emissions of the six major greenhouse gases in all sectors of the economy. But Bingaman would cap the initial price of an emissions credit at \$7 per metric ton of CO₂ equivalent. That so-called “safety valve” price for emissions credits would be allowed to rise at a rate of 5 percent per year in nominal terms. Also, unlike the McCain-Lieberman proposal, Bingaman would set a fixed target not on absolute emissions, but rather on the rate at which emissions are expected to increase as the economy expands. To achieve this, he would impose a mandatory “intensity” limit that would reduce emissions relative to economic output at a rate of 2.4 percent per year. Supporters of Bingaman’s plan include the bipartisan National Commission on Energy Policy (NCEP), a nonprofit group created by several charitable foundations that helped devise the safety valve proposal. Advisors for NCEP include academics, energy executives, and former government officials. (See the Appendix on page 14 for a side-by-side comparison of the McCain-Lieberman, Carper-Chafee, and Bingaman plans.)

Although these three clean air measures differ in scope and design, they are nonetheless compatible: all would impose first-ever mandatory caps on carbon dioxide emissions, the main culprit in global warming; all would achieve reductions by creating a market for tradable greenhouse gas emissions allowances; and all are superior to the president's preferred voluntary approach, which does nothing to compel reductions of harmful emissions. Moreover, when the individual plans' other features are added to the policy mix, all of the necessary ingredients are present for establishing a robust national emissions-control system that could cost-effectively curb emissions of all major greenhouse gases and other dangerous environmental pollutants.

Understanding how the legislative proposals currently under consideration could compliment one another is a logical first step in designing a roadmap to win the war on global warming. Additional steps should include measures to ensure that a dynamic trading market for emissions allowances emerges, and measures to accelerate a broader transition to a clean energy future for the United States—something the recently enacted energy bill contemplates, but fails to fully deliver. A comprehensive new clean air strategy should thus include at least five prongs:

1. **Proceed stepwise toward a national cap-and-trade system for greenhouse gases and other dangerous environmental pollutants** by first capping CO₂, NO_x, SO₂, and mercury in the power sector, as envisioned in the Carper-Chafee plan, and then moving quickly to a broad, economy-wide system that includes all six major greenhouse gases, as envisioned in the McCain-Lieberman plan. Depending on how the trading system works in practice, lawmakers may also want to consider designing a safety-valve provision similar to the one Sen. Bingaman has envisioned
2. **Spur the transition to a cleaner, more diverse fuel mix**, because capping carbon emissions will create a strong incentive for the U.S. economy—the power sector, in particular—to rely less on carbon-laden fuels such as coal and more on cleaner-burning fuels such as natural gas. In the interests of stability and security, policymakers must act to ensure that the changing U.S. energy portfolio includes a healthy mix of sources ranging from renewable biofuels to nuclear power.
3. **Reward farmers and foresters who reduce and offset the nation's greenhouse gas emissions.** Agriculture and forestry already helps remove carbon dioxide from the atmosphere and, through improved farming techniques, they can remove even more. Including farmers and foresters in the trading market for emissions allowances will provide them with a new source of revenue while also increasing the supply of allowances on the market, which will lower costs for emissions producers and energy consumers.
4. **Allow companies to meet domestic clean air requirements by investing in emissions-reduction initiatives overseas.** This type of investment is the emerging international practice under the Kyoto Protocol, in large part because it can be substantially less expensive in developing countries than in the industrialized world.
5. **Protect low-income consumers from energy price increases.** A cap-and-trade system will be an extremely cost-efficient way to reduce emissions. Nevertheless, there will be costs. Policymakers can defray some or all of those costs for needy families

by selling emissions credits on the trading market, among other steps.

Before turning to an examination of this five-point strategy, it is first necessary to explain why we must enforce limitations on carbon dioxide and other greenhouse gas emissions right away.

Why We Must Cap Carbon and Other Greenhouse Gases Now

In addition to being hazardous to people and the planet, procrastinating on greenhouse gas emissions is just plain bad for business. Rather than giving industry clear regulatory signals so emitters can secure loans and make long-term investments to curb carbon dioxide and other greenhouse gases, the president's preferred voluntary approach simply delays the inevitable—the longer we wait, the higher the cost of reducing emissions to acceptable levels.

By omitting mandatory caps on power plant emissions of CO₂, the president's Clear Skies proposal would only cause companies to make costly retrofits down the road. Moreover, large emitters are not the only ones concerned about high costs in the future. Insurers and investors are increasingly concerned about the cost of floods, droughts, and storm damage that climate change portends.

Costs to Industry

It is becoming increasingly clear that, as global warming promises to take a toll on the natural environment, the costs of doing nothing are also growing for U.S. industries. Experts say the effects of climate change could ultimately cost major companies up to 15 percent of their total market capitalization and slice the value of shareholders' investments by 5 percent to 7 percent.¹⁰

Yet the Bush administration still believes the economic cost of doing something about this

looming global threat is too high, which is why the president withdrew the United States from the Kyoto Protocol (that entered into force in February) and why he continues to oppose measures to cap carbon dioxide here at home.

Rather than pursue mandatory controls on gases implicated in climate change, the president has pursued voluntary measures to reduce greenhouse gases. His Clear Skies proposal continues to omit carbon controls at a time when all but the most cynical of power producers recognize that tough measures to combat climate change are inevitable five or 10 years down the road.

Although the president claims he is concerned about the cost of carbon controls to U.S. firms, Clear Skies would actually impose additional and unnecessary costs. As the Progressive Policy Institute (PPI) has long observed, by omitting mandatory CO₂ controls, Clear Skies encourages power producers to invest exclusively in end-of-smokestack filters and scrubbers that are designed only to control a limited number of pollutants and continue building plants without regard for their CO₂ output.¹¹ Such end-of-pipe technologies are costly near-term investments—and doubly expensive in the long run, since they will likely have to be retrofitted at some point to control CO₂. It would make much better financial sense for companies to invest now in infrastructure that can last 30 years or more. Businesses would undoubtedly benefit in other ways, too, from having certainty in the regulatory process.

Of course, Clear Skies would not only be bad for profit margins, but also for the environment. Omitting CO₂ would actually increase global warming pollutants from power plants, because it would encourage companies to install the end-of-pipe technologies that consume even more energy than more comprehensive strategies to reduce NO_x, SO₂, mercury, and carbon. The only effective way to curb CO₂ emissions from power plants is to burn less carbon-laden fuel. But the end-of-pipe

technologies used to control the three pollutants in the president's plan—essentially fancy smoke-stack filters—reduce power-plant efficiency. As a result, plants have to burn more fuel, and therefore release more carbon dioxide. In fact, in addition to increasing CO₂, Clear Skies may cause increased emissions of NO_x and SO₂, creating more smog and acid-rain, because it would weaken many successful and important parts of the Clean Air Act that currently regulate these two pollutants.

Insurers and Investors Turn Up the Heat

Utility companies are feeling heat from insurers and major investors—including state retirement funds and labor unions—which have examined the long-term economic implications of global warming and are clamoring for action.

In the face of that pressure, some companies are acting, even though the federal government has failed to provide leadership. Last year, for example, Ohio-based utility Cinergy Corp. (which has since been acquired by Duke Energy) announced it signed a letter of intent with the new GE/Bechtel alliance to build a \$900 million, 600-megawatt coal gasification power plant in the Midwest. "Given the high price of oil and the limited supplies of natural gas available, coal is the most practical alternative," said Cinergy chairman and chief executive James E. Rogers. "Our challenge is to find ways to use an abundant resource in an economic and environmentally clean way. Coal gasification has proven to be efficient, and there is no cleaner coal technology."¹²

In December 2004, Rogers said he also predicts mandatory emissions limits down the road, calling upon Congress to "take the unnecessary uncertainty out of national environmental policy."¹³ Similarly, Dale Heydlauff, senior vice president of environmental affairs for American Electric Power Co., said his firm

has opted to limit carbon dioxide emissions at its coal fired plants because, "we felt it was inevitable that we were going to live in a carbon-constrained world."¹⁴ And in May of this year, GE became the latest major U.S. company to commit to greenhouse gas reductions when it announced plans to reduce greenhouse gas emissions by 1 percent during the next seven years and increase energy efficiency by 30 percent by 2012. Absent such measures, GE's greenhouse gas emissions would grow by 40 to 45 percent during that time.

In addition to industry actions, two major studies released in December 2004 called for Congress to pass mandatory carbon dioxide caps. The nonpartisan group Resources for the Future urged the president to impose "modest but firm" limits on greenhouse gas emissions.¹⁵ Similarly, the bipartisan NCEP recommended that U.S. energy policy undergo a gradual but clear shift in direction through a mandatory program to limit gases implicated in climate change.¹⁶

With two bipartisan proposals on the table—McCain-Lieberman and Carper-Chafee—and a third in the works by Sen. Bingaman, progressives and moderate Republicans can and must create a solution that they can all stand firmly behind.

A Five-Point National Emissions-Control Strategy

Clearly, a growing number of elected officials, industry leaders, and experts agree on the need to impose mandatory greenhouse gas controls. Yet many still differ on such issues as exactly how much Congress should ask companies to reduce their emissions. Many also disagree about how quickly such reductions should be achieved since quick, steep reductions are thought to impose unacceptably high costs on regulated entities and on the consumers to whom they must pass these costs.

In addition, those who agree that we should cap carbon dioxide and other greenhouse gases now remain divided about the best approach. While some prefer to seek reductions first from the power sector, others maintain that we should start with economy-wide measures, which they say are inevitable anyway. Supporters of the Lieberman-McCain proposal also say economy-wide measures are less costly because they expand the number of regulated sources that can trade emissions allocations and therefore increase the likelihood that those who have excess greenhouse gas allowances to sell will find buyers.

Fortunately, advocates for reducing climate change have found a number of broad areas of agreement around which they can begin to resolve some of these questions. The path forward will involve the following five steps.

1. Proceed Stepwise Toward a National Cap-and-Trade System for Greenhouse Gases and Other Dangerous Environmental Pollutants

There are good arguments in favor of both the McCain-Lieberman and Carper-Chafee plans. One would create the national, market-based emissions-control system that we must eventually have (the sooner, the better), and the other may represent the most politically expedient first step in that direction. Therefore, lawmakers need not choose between them. They should support both plans, and pass the first one that gains the requisite political support.

The McCain-Lieberman legislation has already come up twice for a vote in the Senate, once in 2003 and more recently during this summer's energy debate, when it failed by a surprisingly narrow margin. McCain has said he intends to keep reintroducing the measure until it passes. But it is unclear when the next opportunity will arise. In the meantime, there is an opportunity for Democrats and moderate Republicans to focus on the Carper-Chafee

bill. With new EPA data showing that CO₂ controls will cost less than critics in the administration claim while delivering far greater benefits than the president's Clear Skies proposal, a power plant approach might stand a good chance of gaining Republican support. Moreover, since CAPA is essentially an improvement on the Clear Skies framework, Bush might be able to turn around and embrace it without losing face. The risk that Democrats must guard against is the president and his Republican supporters embracing CAPA and then stripping its essential provisions in a last-minute legislative maneuver before enactment.

According to the EPA, the Clear Skies proposal would cost utilities \$2.9 billion annually in 2010, but \$6.2 billion annually by 2020. The Carper-Chafee proposal would cost \$10.5 billion annually in 2010, but \$9.5 billion annually by 2020. The cost differential steadily narrows over time—in no small part because the EPA pegged the cost to utilities of a carbon dioxide cap at \$1 per ton through 2015 and \$2 per ton in 2020, much lower than earlier administration claims.

On the benefit side—in terms of health improvements from cleaner air, not the climate change implications—the EPA estimates show a much bigger differential. The Carper-Chafee bill would achieve annual health gains of up to \$128 billion in 2010, \$137 billion in 2015, and \$161 billion in 2020. This compares with health benefits of \$79 billion annually in 2010, \$106 billion in 2015 and \$140 billion in 2020 for Clear Skies. And that is before considering the climate change implications of capping carbon; the economic implications of spurring technological innovation in utility improvements; and the national security and foreign policy value of getting the United States back into a leadership position on global environmental and energy policy challenges.

Lawmakers should not rest on their laurels if the Carper-Chafee plan passes, however. They should aim to expand the program to the

national scale within a few years, rolling in the remaining five major greenhouse gases, as envisioned by Sens. McCain and Lieberman. Similarly, if the stars line up in such a way that the McCain-Lieberman plan passes first, lawmakers should move quickly to include the three additional environmental pollutants covered in the Carper-Chafee bill.

To Trade or Not to Trade Mercury?

Merging a power-sector approach with an economy-wide effort would serve to reduce emissions implicated in global warming, as well as power plant emissions of SO₂, NO_x, and mercury, which cause smog, soot, asthma, and acid rain.¹⁷ One sticking point in such a strategy involves the problem of mercury. Unlike gases that dissipate widely after they are emitted into the atmosphere, mercury is a heavy metal—and a potent neurotoxin—that falls quickly to the Earth, contaminating ground water, streams, and rivers near the smokestacks that emit mercury. Humans are then exposed when they eat fish, which accumulate mercury in their fat cells. As a result, most environmental groups and many health experts are concerned that a cap-and-trade system for mercury could create “hot spots” around power plants that decide to buy extra mercury emissions allowances instead of actually reducing their emissions.

A cap-and-trade system, PPI believes, could be designed to prevent hot spots from occurring. For example, the EPA could determine the level of mercury emissions that would constitute a hot spot, and then establish local mercury emissions caps that are safely below that level. Unfortunately, based on the Bush administration’s environmental record, PPI has no confidence in the EPA’s ability to properly design such a system under its current political leadership. Therefore, PPI believes lawmakers should exclude mercury from the cap-and-trade system for other gases, and instead subject it to its own end-of-pipe technology standards.

Safety Valve or No Safety Valve?

One reason the McCain-Lieberman proposal would lower costs for households is the proposal’s very moderate cap on greenhouse gases, requiring emissions to be at 2000 levels by 2010. Since emissions have been relatively flat during the last few years, this would essentially be capping emissions at today’s levels. While a moderate cap does not reduce greenhouse gas emissions as quickly as some in the environmental community would like, gradual reduction requirements are less costly to the regulated community because they give emitters the time and ability to search for the most effective and cost-efficient greenhouse gas reduction measures.

To further moderate prices, the McCain-Lieberman proposal would allow emissions to increase above 2000 levels if emitters choose to buy inexpensive “offsets” from farmers who can demonstrate that they are sequestering greenhouse gas emissions.

However, because the United States lacks actual experience in regulating greenhouse gas emissions in a cap-and-trade system, there are lingering uncertainties as to how much such a system will cost emitters in practice. To guard against unexpected increases in the market price of emissions allowances—and help build political support for a comprehensive clean air reform—economists have devised safety valve provisions, as reflected in Sen. Bingaman’s plan.

As the term suggests, a safety valve is a price ceiling that would take effect if economic growth or other factors cause the price of emissions allowances to spike. The closely related “circuit breaker” concept would temporarily suspend a mandatory greenhouse gas cap if the market pushes the price of emissions credits over a predetermined price.

Although the idea of a safety valve offers the most reassurance to industry, this type of price ceiling would distort the market and weaken the signals it sends emitters about the

urgency of increasing efficiency and reducing emissions—which could keep the country from meeting its emissions reduction goals.

To forge a path forward on climate change, progressives and moderate Republicans need to decide whether a safety valve would unacceptably weaken a mandatory emissions cap, or whether such a provision would represent the compromise necessary to gain broad political support.

2. Spur the Transition to a Cleaner, More Diverse Fuel Mix

Take the Pressure Off Natural Gas Prices

Unlike coal or oil, when natural gas is used to generate electricity or power vehicles, it emits far fewer smog-causing substances and greenhouse gases. Unfortunately, the promise of natural gas is also a pitfall. The cost of natural gas is skyrocketing because more utilities rely on it to generate electricity and cheap, abundant U.S. supplies are shrinking. Prices today are \$4.00 to \$5.00 per thousand cubic feet (Mcf)—double their level in the 1990s—and the U.S. Energy Information Administration (EIA) foresees no end to that rapid price inflation. The unprecedented surge in natural gas prices has put the squeeze on American families, farmers, and businesses. For example, soaring prices are forcing chemical and fertilizer producers that rely on natural gas to relocate overseas and causing American families to pay higher annual utility bills. It is therefore imperative that climate change reforms do not depend too much on natural gas over other energy sources, such as coal and nuclear power.

Make Nuclear Power Part of the Diverse Energy Mix

In the case of nuclear power, federal investments, including loan guarantees and tax

credits in the recently enacted energy bill, promise to trim \$200 million to \$300 million off the costs of new reactors and allow new nuclear plants to generate power more cheaply than gas- and coal-fired plants. Such initiatives notwithstanding, lawmakers should acknowledge nuclear power's potential not only to reduce undue reliance on natural gas, but also help combat climate change and clean up the air.

The Nuclear Regulatory Commission has certified three, new plant designs that promise to produce power more safely and economically than first-generation facilities, many of which will soon need to be retired. The new designs contain significantly fewer pumps, piping, valves, and cables, so there are fewer items to install, inspect, and maintain than in traditional plants. From a safety perspective, the new plants rely on natural forces, such as gravity, natural circulation, and condensation, assuring safe shutdown even in the unlikely event of an accident. In addition to these three new approved designs, at least four other designs may soon win NRC approval. Among these is the promising new modular, “pebble bed” reactor design. As the name suggests, these smaller plants would use hundreds of thousands of uranium pebbles rather than large cores to generate power. As researchers at MIT recently concluded, these pebbles burn more completely than their traditional counterparts and are thus less of a weapons proliferation concern, since there is less viable material left at the end of the process.

Despite the promise of these new designs, it will take time for the public and regulators to review them, and longer to bring next-generation facilities online.

Look to Promising Interim Energy Policy Measures

Fortunately, a suite of more immediate policy measures also exists—ranging from improving

energy efficiency to increasing reliance on alternative energy sources—that could help take pressure off natural gas prices by increasing its supply and reducing demand. In a recent policy brief on the subject, PPI called for several measures, including the construction of a pipeline to bring natural gas from Alaska to the lower 48 states, and measures to tap into abundant supplies in the central and western Gulf of Mexico.¹⁸ Several PPI recommendations are contained in the recently passed energy bill. But the energy bill contains more controversial provisions to expand natural gas production, take an inventory of U.S. offshore natural gas resources, and speed the approval process to build facilities for importing liquefied natural gas into U.S. ports and harbors by vesting authority for terminal construction with the federal government rather than states or municipalities.

One of the most effective and efficient ways to reduce natural gas use is to improve energy efficiency, which would reduce demand for electricity and, by extension, demand for the natural gas used to generate electricity. For example, the recently passed energy legislation provides some consumer tax incentives for purchases of energy-efficient appliances and housing materials. Lawmakers should create even more incentives for producers and consumers to do more with less electricity. One sensible measure, contemplated but ultimately rejected during energy bill deliberations, would be for Congress to create a national renewable portfolio standard for electric utilities to lessen dependence on all fossil fuels, including natural gas. Steps like these can help natural gas serve as a bridge to a cleaner energy future without creating undue reliance on it.

Spur the Adoption of “Clean Coal” Technology

With natural gas prices soaring and prospects for increasing nuclear, solar, and

wind power just getting off the ground, coal’s profile is higher than it has been in decades. The U.S. Department of Energy says coal will remain our main source of electricity through 2025 and predicts we will need more than 100 new coal-fired plants between now and then just to keep pace with demand.

For policymakers, the big question is, “How clean can we make those plants as well as the ones we already have?” Despite a fairly successful decades-long push to make existing coal-fired plants cleaner, the foregoing discussion underscores the fact that they remain a leading source of SO₂, NO_x, CO₂, and mercury pollution.

Some environmentalists insist there is no such thing as clean coal, therefore massive, rapid conversion to renewable energy is the only proper course. Such arguments ignore the fact that it is possible, however, to produce electricity from coal about as cleanly as from natural gas, which most environmentalists and public health advocates favor over coal (though not as passionately as they favor renewable energy sources). The technology that makes this possible is known as “integrated gasification combined cycle” (IGCC) or coal gasification for short. When combined with carbon sequestration, IGCC represents a way to make electricity from coal that produces far less air pollution, greenhouse gas emissions, and waste than prevailing methods.¹⁹

Conventional coal-fired power plants burn pulverized coal or a coal-water slurry. In contrast, IGCC plants turn coal into a synthetic gas composed mainly of hydrogen (which can be tapped off for use in fuel cells) and carbon monoxide (which can be burned). The gas is processed to remove 95 percent or more of its sulfur and nitrogen impurities, making it nearly as clean-burning as natural gas.

The cleaned-up gas is burned in a turbine to create one source of electricity. Then the heated exhaust is captured to boil water, creating steam to drive a second electricity-

generating turbine. This latter exhaust contains carbon dioxide in a highly concentrated form, which makes it easier to capture and keep out of the environment, for example by pumping it into the ground.

Today's IGCC plants operate at about 40 percent efficiency, compared with the roughly 33 percent efficiency of conventional plants. This means that they burn less coal to yield the same amount of energy and thus emit fewer pollutants, including less carbon dioxide. Experts say future gasification plants should achieve efficiencies of 50 percent or higher.²⁰

Coal gasification technology can be retrofitted onto existing plants, albeit at significant cost. Gasification plants can also be configured to run on virtually any carbon-based fuel or blend of fuels, including municipal solid waste that would otherwise end up in a landfill. In addition, gasification plants use less than one-half the amount of water as conventional coal-fired plants, which would be of tremendous benefit in the arid West.

Unfortunately, IGCC plants are still 25 percent more expensive to build than conventional ones. The recently passed energy legislation provides a tax credit to offset those higher construction costs. While this is a promising start, lawmakers must continue to include mechanisms and a funding stream to further commercialize this promising new technology and to assist in the development of sequestration projects that connect to these new plants.

Promote Greater Use of Fuels From Renewable Resources

With growing costs of importing oil—mostly from relatively unstable regions—and a concern that oil profits help fund terrorist groups, there are good reasons in addition to reducing carbon emissions to turn toward renewable biofuels. As outlined in a recent PPI case study, biofuels are made from renewable plants and vegetables, rather than the world's

finite fossil fuels.²¹ Such fuels encompass a range of promising products including biodiesel from peanuts, ethanol from corn, and cellulosic ethanol made from harvested corn stalks and other crop waste that otherwise would decay in fields, releasing harmful greenhouse gases like methane. Biofuels can even be produced from used restaurant grease and cooking oil.

In 2004, corn-based ethanol fuels comprised only about 2 percent of transportation motor fuels sold—primarily because, without government incentives, biodiesel is much more costly to produce than regular diesel. Depending on the material used, it could cost \$.75 to \$1 more per gallon than petrodiesel, some analysts have said. The recently enacted energy legislation included tax credits for fuel distributors who blend biodiesel with petrodiesel and fuel stations that provide biodiesel pumps to customers.

Since biofuels are infinitely renewable, relatively clean burning, safe to handle, and produced here on American soil, we must do a better job of enhancing the development and deployment of biofuels—in particular cellulosic ethanol, which is a more effective offset for greenhouse gas emissions than regular ethanol.

3. Reward Farmers and Foresters Who Reduce and Offset the Nation's Greenhouse Gas Emissions

Despite uncertain support for carbon regulation from the agricultural sector, carbon constraints could be relatively easily achieved by farmers. Farming has the potential to keep carbon dioxide and other greenhouse gases in the ground and out of the Earth's upper atmosphere through natural "sequestration" measures such as "no-till" farming, which reduces the release of carbon dioxide from decaying plant material by starting new crops amid the residue of the previous year's harvest. Other sequestration practices include conversion of marginal farmland to grassland

and substituting biomass and energy crops for fossil fuels.

According to the U.S. Department of Agriculture, major farming states can potentially sequester more than 8 percent of the 1.9 billion metric tons of greenhouse gas emitted in the United States annually. The Consortium for Agricultural Soils Mitigation of Greenhouse Gases, made up of nine U.S. universities and the Batelle-Pacific Northwest National Laboratory, says the figure could climb to 20 percent if farms adopt sequestration practices widely.²² Those practices could also produce an economic boon for farmers if they were allowed to sell emissions credits to carbon-producing companies in a market-based cap-and-trade system.

Richard Sandor, a Northwestern University expert on cap-and-trade policies and head of the Chicago Climate Exchange, points out that carbon markets, while providing billions of dollars in extra revenue to the farm economy, can also “soften farm income cycles by taking land out of crop production and putting it into conservation uses when relative prices favor carbon sequestering over food production.”²³

Such gains to the nation’s heartland could be expanded even further through a reform effort that includes provisions to support the development of renewable biofuels.

4. Allow Companies to Meet Domestic Clean Air Requirements by Investing in Emissions-Reduction Initiatives Overseas

The Kyoto Protocol includes a provision that allows companies in developed countries to meet their emissions-control requirements by investing in clean plants and facilities overseas, not just at home. That is a sensible policy for several reasons. First, global warming is obviously a global problem, so it is a good idea to promote emissions-control activities everywhere. Second, such investments may cost

considerably less in developing countries than in the industrialized world.

For the United States, such a provision could also have the added benefit of making our domestic emissions control efforts more consistent with international practices. That could help pave the way for America to formally join most other industrialized nations in the global emissions reduction system after the first phase of the Kyoto Protocol expires in 2012.

For those reasons, PPI believes U.S. emitters should be allowed to meet their domestic requirements by investing in overseas projects—as long as those projects can be monitored to verify emissions levels.

5. Protect Low-Income Consumers From Energy Price Increases

With modest reduction targets, both the McCain-Lieberman formula and the Bingaman proposal are not expected to increase energy prices very much (probably well under \$20 per household per year). Nevertheless, lawmakers must provide strong protections to insure the nation’s most needy households are not subject to price increases that would result from mandatory carbon caps. Presently, the McCain-Lieberman bill keeps the price of curbing climate change low for consumers by including moderate emissions caps. The proposal would also allow emissions to increase initially, provided that its modest goals are eventually met. In addition, government could use proceeds from the sale of trading allowances to help offset higher electricity and heating costs to the most vulnerable consumers. Another potential mechanism to control the cost of greenhouse gas reduction is the safety valve provision discussed above.

Conclusion

President Bush has been shamefully slow in admitting that human activities are gradually causing the planet to heat up. And even though

he has now finally crossed an important Rubicon by recognizing the science of climate change, for the moment, he clings to his stubborn refusal to take serious measures to stop global warming. But, as PPI and others have noted elsewhere, the president has a heartening record of reversing his position when the political writing is on the wall.²³ So, we can reasonably hold out hope that he may yet make an abrupt U-turn and give his blessing to bipartisan efforts in the Congress to make real progress on clean air.

There are several promising plans on the table to curb greenhouse gas emissions. Now is the time for progressives and moderate Republicans to cap carbon dioxide now. Identifying and refining areas on which lawmakers can agree—as this policy paper has attempted—will help to ensure that they are ready when the president is finally willing to deal seriously with a problem most experts agree is the greatest environmental challenge of the 21st century.

Appendix: Three Clean Air Proposals Compared

SPONSOR	McCain-Lieberman	Carper-Chafee	Bingaman
PROPOSAL	Climate Stewardship and Innovation Act (S.1151)	Clean Air Planning Act (H.R.1873)*	N/A-still drafting**
GASES COVERED	All six major greenhouse gases: carbon dioxide (CO ₂), methane, nitrous oxides (N ₂ O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride	Carbon dioxide (CO ₂) plus three pollutants that cause smog, acid rain, neurological damage, respectively: nitrogen oxides (NO _x), sulfur dioxide (SO ₂), and mercury	All six major greenhouse gases: carbon dioxide (CO ₂), methane, nitrous oxides (N ₂ O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride
SECTORS	Economy wide	Power sector	Economy wide
EMISSIONS CAP	Hard cap on allowable volume of emissions	Hard cap on allowable volume of emissions	Cap on intensity of emissions: the volume of allowable emissions is reduced relative to economic output.
EMISSIONS CREDIT TRADING MARKET	Market determines emissions credit prices	Market determines emissions credit prices	Safety valve to control emissions credit prices
TARGETS	2000 levels by 2010	- 2005 levels by 2000 - 2001 levels by 2012	-2.4% intensity reduction per year starting in 2010 -2.8% intensity reduction per year starting in 2020
MAIN SUPPORTERS	Natural Gas Association, mayors, and farmers	Utility companies	Coalition of nonprofit foundations

*Upon publication of this report, the Senate version has not yet been introduced.

**The forthcoming plan proposed by Sen. Jeff Bingaman (D-N.M.) is based on National Commission on Energy Policy (NCEP) recommendations found in "Comparison of Commission GHG Proposal to Other Domestic Climate Change Policies," NCEP, p. 26, Table 2-1, December 2004, <http://www.energycommission.org/ewebeditpro/items/O82F4682.pdf>.

SOURCES: *Climate Stewardship and Innovation Act of 2005*, 109th Congress, 1st Sess., S. 1151 (IS); *Clean Air Planning Act of 2005*, 109th Congress, 1st Sess., H.R. 1873.

Endnotes

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