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How Much Would You Pay to Save the Planet? The American Press and the Economics of Climate Change

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Introduction

Suppose our leading scientists discovered that a meteor, hurtling toward the earth, was set to strike later this century; the governments of the world had less than ten years to divert or destroy it. How would news organizations cover this story? Even in an era of financial distress, they would throw teams of reporters at it and give them the resources needed to follow it in extraordinary depth and detail. After all, the race to stop the meteor would be the story of the century.

When it comes to global climate change, it is sometimes said that we are the meteor.¹ The analogy is imperfect, of course. Climate change is slow and gradual, at least for now, unfolding on a time scale that confounds the capacities of our politics, our economics, and our journalism. Abrupt, rapid disruptions are likely, but no one can say when they may come. Despite the uncertainties, climate scientists have no doubt that the impact is already being felt and little doubt that future consequences will be severe to catastrophic.² It is too late to “prevent” global warming, but it may yet be possible to avoid cataclysm. Doing so, environmental experts overwhelmingly agree, requires decarbonizing our economy—not with a meteor-smashing space shot but with a broad, urgent World War II–style mobilization. Intense opposition to that sort of action remains, in part due to fears of rising energy costs in a carbon-constrained world. Well-designed policies are the key to reducing emissions while avoiding price spikes, and public support is the key to passing those policies into law. A vigorous press ought to be central to both climate policy and climate politics, but this is not a time of media vigor. The American press has been hit by a meteor of its own, a secular revenue decline that is driving

huge reductions in newsroom staff and making disciplined climate coverage less likely just as it becomes most crucial. So it is well worth asking: How is the press doing on the climate solutions story?

This paper attempts to answer that question by examining coverage of the economic debate over Senate Bill 2191, the Lieberman-Warner Climate Security Act of 2008. The economics of climate policy—not the science of climate change—is at the heart of our story because the most important step toward national mobilization is putting a price on carbon emissions, either through a carbon tax or, in Lieberman-Warner’s case, a mandatory declining cap. This is the great political test, and the great story, of our time. But news organizations have not been treating it that way.

A Challenge to Reporters

How much will it cost to begin turning back the tide of climate change? In April 2008, the Environmental Defense Fund (EDF) set out to answer that question in a conference call for reporters covering the Lieberman-Warner bill. EDF took an almost paternal interest in this piece of legislation, which was sponsored by Senators Joe Lieberman (I-CT) and John Warner (R-VA), because the organization was an architect of the market-based regulation at its heart: a cap-and-trade system that would limit the amount of global warming pollution U.S. industry can send into the skies and establish a new market in which large emitters buy and sell pollution permits, creating a profit motive for going green. If Lieberman-Warner became law, it would mean the U.S. was finally joining the rest of the industrialized world in the effort to slow global warming before the earth reaches an irreversible tipping point.

But no one expected the bill to pass. Although it enjoyed support from the green wing of the Fortune 500—GE, Alcoa, Exelon and others who see opportunity in a low-carbon future—Lieberman-Warner faced overwhelming opposition from industry lobbies such as the National Association of Manufacturers (NAM), which claimed the bill could double electricity prices, drive gasoline to \$8 a gallon, destroy up to 4 million jobs, and drain as much as \$669 billion from U.S. gross domestic product by 2030.³ NAM teamed up with the American Council for Capital Formation (ACCF), a conservative think tank, which came up with those frightening predictions by feeding pessimistic assumptions about future economic activity into a computer model, producing a doomsday forecast⁴ that the press reported as news. (No economic model can predict the future, but NAM and ACCF often behaved as if they had a crystal ball, and some reporters played along.) In the first six months of 2008, as the Lieberman-Warner bill approached the Senate floor, the oil and coal industries spent \$427 million on advertising and lobbying.⁵ The U.S. Chamber of Commerce, another opponent of mandatory CO₂ reductions, held a series of “Climate Change Dialogues” around the country that spread the scary NAM/ACCF numbers, and ran a television commercial in which an actor cooked breakfast over candle flame and jogged to work to show what life would be like under cap and trade. The coal lobby prepared a TV spot warning that without cheap, high-carbon fuel, “We may have to say ‘goodbye’ to the American way of life we all know and love.”⁶

The Environmental Defense Fund’s April conference call was intended to rebut these claims by releasing a report⁷ of its own—one that warned, “Don’t trust any single number,”⁸ then aggregated five respected academic and governmental stud-

ies to show the emerging mainstream economic consensus on the issue: Though by no means cost-free, a well-designed cap-and-trade system’s effect on U.S. economic growth would be far less severe than NAM’s report and other doomsday models suggested. EDF’s study was not without spin; it gave scant attention to the regional impacts of cap and trade, which are potentially severe for states that get their electricity from coal-fired power plants, and presented its conclusions in the most favorable light. But it was honest about that. “Let us be clear. These same model results can be presented in other ways,” the report stated. “Opponents of taking action will cherry-pick the largest numbers and focus on them—as if any single model in isolation were a reliable guide to the future....They will seek to scare people by presenting these figures alone, out of context.”⁹

The five studies analyzed by EDF suggested that cap and trade could slow economic growth by about one-half of one percent of GDP by 2030, and by about three-quarters of one percent by 2050. Other credible projections of cap and trade’s impact have come in slightly higher, at about one percent of GDP.¹⁰ Is that a lot or a little? Well, it’s clearly a great deal of money (U.S. GDP in 2007 was \$13.8 trillion), but the cumulative cost of all U.S. environmental regulation to date is also estimated at one percent of GDP,¹¹ and that has not been an insupportable burden. (By comparison, the global financial crisis of 2008—an ugly reminder of how hard it is to comprehend or predict the forces that drive the economy—may have reduced U.S. GDP by five percent in the fourth quarter of 2008 alone.) A well-designed cap-and-trade system would be a slight drag on growth, not an economy killer. This is important stuff: not “proof” of anything, given the hazards of economic modeling, but a clear

signpost amid the haze of economic uncertainty.

Peter Goldmark, the former publisher of the *International Herald Tribune* who now directs EDF's Climate and Air Program, wasn't confident that journalists would be able to recognize this emerging consensus. He wasn't sure they would notice the difference between EDF's meta-study and the dire forecasts of NAM and others. He knew that reporters tend to assign equal weight to two sides of an argument even if the two sides aren't equivalent. To give their stories drama and a feeling of balance, they seek opposing views even if the majority of experts agree and the dissenters lack credibility. A recent case in point: coverage of climate science from the mid-1990s through 2005, a time when a small group of skeptical scientists was often accorded equal weight alongside the majority of climatologists who agree about the basic science. Reporters are trained to "find the argument." On the climate beat, says Andrew C. Revkin, the highly regarded environmental reporter for the *New York Times*, it's crucial to "find the agreement" as well.¹²

All of which explains why the second purpose of EDF's April conference call was to deliver a challenge to reporters. Goldmark kicked off the call with some pointed remarks. "Climate policy has been a tough subject for reporters," he said.

It took ten years to get to the point where it was accepted that there were *not* two equally valid sides to climate science. Millions of dollars were spent by people deliberately trying to confuse that issue, and they are doing it again today. They're doing it on the cost issue because they lost the science battle. They're trying to scare the public into thinking this bill is going to put people out of work and damage

the economy. We are at the beginning of a new debate—and we don't have ten years to get this one right.¹³

The syndrome Goldmark describes is sometimes called "balance as bias"¹⁴ or "he said, she said" reporting. It is a condition in which journalists stick to the role of stenographer, recording two sides of a debate even when the two sides are not of equal merit (or when there are three or four sides). Notions of journalistic objectivity, Goldmark suggested, shouldn't prevent reporters from recognizing consensus and making judgments based on the best available evidence. Instead, they should help the public decide who is right and who is wrong in a debate where the stakes—our economy, our planet—could not be higher.

Goldmark's challenge offers a powerful lens through which to view coverage of the climate debate because each climate and energy reporter takes an implicit position on the issue simply by choosing what sort of journalistic role to play. Will she be a stenographer, recording the give and take of the debate without commentary, at most favoring one side through the selection and presentation of facts but shying away from firm conclusions? Will she be a referee, keeping both sides honest by calling fouls and failures to play by the rules? Or will he appoint himself judge and jury, passing sentence on who is right and wrong?

Each of these may be appropriate at times, but in this ferocious public policy debate, in my view, the most valuable journalistic role is that of referee. Reporters who permanently restrict themselves to stenography aren't adding much—and risk shirking their journalistic responsibilities. Reporters who see themselves as judges, advocates or peddlers of opinion should trade their beat for a column or

blog. But reporters who aim to serve as honest referees—keeping score, throwing flags when a team plays fast and loose with the facts, explaining to the audience what’s happening on the field and why—serve a crucial purpose in the debate. Inevitably, they shoulder heavier responsibilities as well. Their work must be transparent: When they make a judgment, they must present the evidence upon which it is based. Being a referee is harder than being a stenographer because it requires grappling with the substance of an issue in a way that many time-pressed journalists aren’t willing or able to do. By stating conclusions rather than merely hinting at them, referees can make themselves targets, open to attack from aggrieved combatants; some reporters and news organizations aren’t comfortable with that. They don’t want to be accused of taking sides, in part because that alienates sources. But in an era when journalism is in danger of being marginalized by the commodification of news; the rise of online media; and the drip, drip, drip of financial decline; survival requires taking risks and adding real value. Doubling down on serious work—by making complex issues understandable and even compelling, by offering honest judgment along with clear supporting evidence—is the best recipe for continued relevance.

Reporters who take the time to dig deeper soon discover that it is possible to shine a light on this murky, emotional policy debate without becoming an advocate. Doing so takes work. It means subjecting the arguments on both sides to rigorous analysis, peeling back the layers of the onion to see how those arguments were constructed, and analyzing the assumptions that lie beneath them. It means keeping in mind that historically, when researchers have estimated the cost of compliance with new environmental regulations—for asbestos, benzene, chlorofluorocarbons,

sulfur dioxide—the researchers have wildly overestimated compliance costs¹⁵ because unanticipated technological innovations tend to bring those costs down. (One utility-funded study in 1989 predicted that sulfur dioxide scrubbers to prevent acid rain would cost electricity ratepayers \$5.5 billion annually between 1990 and 2000; after the acid-rain cleanup went ahead despite industry opposition, electricity rates *declined* by an average of 19 percent between 1990 and 2006.¹⁶) These precedents don’t mean we can blithely ignore the cost issue; carbon emissions are pervasive, and taming them will be one of the hardest things we ever do. But any cost projection should be met with a cool eye. It simply isn’t good enough to serve up the guesstimates of economic modeling as if they were facts. “One of the great lapses of climate reporting, including my own, is an inadequate critique of economic modeling,” says Revkin, whose Dot Earth blog has become an important nexus of climate science and policy debate. “The media have dropped the ball completely on the economics of climate. It’s still a challenge within the *New York Times*—even before the economic implosion—to get people to focus on the economics of this.”¹⁷

News coverage of the Lieberman-Warner debate included some shoddy, one-sided reporting and some strong work that took the time both to dive into the policy weeds—evaluating the economic assumptions used by the various players—and step back to portray those players as combatants in a war for public opinion. But most of the reporting was bad in the painstakingly balanced way of so much daily journalism—two sides, no real meat. My analysis of news articles published in national and regional newspapers, wire services, and newsmagazines between December 2007 and June 2008 suggests that for most reporters covering this story, the

default role was that of stenographer—presenting a nominally balanced view of the debate without questioning the validity of the arguments, sometimes even ignoring evidence that one side was twisting truth. Database searches yielded a sample of 40 published news and analysis stories that explored the cost debate in some detail (see appendix). Of these, seven stories were one-sided. Twenty-four stories were works of journalistic stenography. And nine stories attempted, with varying degrees of success, to move past the binary debate, weigh the arguments, and reach conclusions about this thorny issue.

No legislative proposal should get a free pass. Lieberman-Warner was far from perfect, but sensational cost studies like NAM's were designed to thwart debate, not improve the bill. And the media's collective decision to play the stenographer role actually helped opponents of climate action stifle progress. Specifically, the journalistic stenography was damaging in three ways.

1. The press misrepresented the economic debate over cap and trade. It failed to recognize the emerging consensus among economists that cap and trade would have a marginal effect on economic growth and gave doomsday forecasts coequal status with nonpartisan ones. In other words, Peter Goldmark's fear came true: The press allowed opponents of climate action to replicate the false debate over climate science in the realm of climate economics.

2. The press failed to perform the basic service of making climate policy and its economic impact understandable to the reader and allowed opponents of climate action to set the terms of the cost debate. The argument centered on the short-term costs

of taking action—i.e., higher electricity and gasoline prices—and sometimes assumed that doing nothing about climate change carried no cost. In fact, economists overwhelmingly agree that business as usual will lead to greatly increased societal costs as the impacts of climate change set in. These costs were often left out of the story.

3. Editors failed to devote sufficient resources to the climate story. In general, global warming is still being shoved into the “environment” pigeonhole, along with the spotted owls and delta smelt, when it is clearly to society's detriment to think about the subject that way. It is time for editors to treat climate policy as a permanent, important beat: tracking a mobilization for the moral equivalent of war.

A Disposable Beat

Mainstream coverage of climate science has begun to mature in recent years.¹⁸ In November 2007, the Fourth Assessment Report of the U.N. Intergovernmental Panel on Climate Change (IPCC)¹⁹ removed any last vestige of doubt about the basic problem: The planet is warming, man is the cause, and reductions in the growth of greenhouse gas emissions must start now to mitigate global climate disruptions. Though journalism often fails to convey the urgency and enormity of this challenge, it now generally articulates the basic consensus without feeling honor-bound to hunt down opposing views for reasons of putative balance. That's progress. (The balance issue is examined in the next section of this paper.)

As it has grown up, climate science reporting has come under assault from the same economic forces that are eroding journalism in general. According to a new

study²⁰ of 50 newspapers in 20 countries, the quantity of climate coverage has been on the decline since a high water mark in 2007, which saw the release of the fourth IPCC report and heightened public concern generated by Al Gore's 2006 film *An Inconvenient Truth*. Some of the decline may be due to climate fatigue among editors, but some surely comes from industry-wide layoffs that degrade the ability of news outlets to cover any specialized topic. Major chains such as Cox Newspapers and Advance Publications are shutting down their Washington bureaus, and CNN recently dismissed its entire seven-person science-and-environment unit.²¹

If coverage of climate science is an at-risk adolescent, then coverage of climate policy is an infant threatened by crib death. Editors at cash-strapped news organizations simply have not allocated sufficient resources to the subject, treating it as “a disposable beat,” according to staffers at several national newspapers. When another story gets hot—a presidential campaign, a fiscal crisis—reporters get yanked off the beat. Few have the luxury of covering it full-time; most are energy, environment, or political reporters pressed into service on a subject that requires them to wrestle with all of those issues at once. “Good coverage is still relatively scarce,” says Steven Mufson, veteran energy reporter for the *Washington Post*. “This is complicated stuff, tough to cover if you’re not well versed.”²²

Ideally, a climate policy team would include an environmental science reporter, an energy/business reporter, and a political reporter. The science reporter typically understands the climate threat but not the economic costs or the political barriers that block passage of legislation. (“I would have to go back to school to get a clear sense of which economic models work and which don’t,” says Revkin.) The busi-

ness reporter sees the costs of action but may not grasp the cost of inaction or the urgency of the threat. And the political reporter knows why it’s hard to close a deal but may not understand that legislative compromises may be disastrous because the climatic effect of greenhouse gas concentration is non-negotiable.

In January 2009, the *New York Times* launched an ambitious version of this collaborative reporting model, creating a new environmental unit made up of eight specialists from the Science, National, Metro, Foreign, and Business desks, including Revkin and Matthew Wald, the paper’s excellent energy reporter.²³ This is an important step by the *Times*, one that could vastly improve its coverage of climate policy—especially if the paper adds a crack political reporter to the new unit, which it so far has not done.

The intricacies of climate policy put particular stress on Capitol Hill reporters who are used to bouncing from topic to topic, bill to bill, and who tend to be more at home with political combat than policy substance. Some of them regard policy with the sort of indifference Alfred Hitchcock felt toward what he called “the MacGuffin,” the plot device that propelled the action in his movies. The details of the MacGuffin were always beside the point. In climate policy, by contrast, the details are hugely important—without understanding them, it’s impossible for a reporter to know which politicians and pressure groups are trying to solve the problem and which are merely posturing. To grasp the policy is to come face to face with the vast gulf that separates what our science says is required to prevent climate catastrophe, and what our politics says is possible. President-elect Barack Obama, for example, recently outlined the goal of reducing greenhouse gases to 1990 levels by 2020. The latest science argues that a

reduction of 25 percent to 40 percent below that level is required to avoid catastrophic warming—and even that may not be enough. Staring into this gulf is the price of admission to the climate beat. Reporters who become acquainted with it have the foundation needed to cover the debate over the short-term economic consequences of climate legislation while explaining to readers why that is ultimately the wrong debate to be having.

Here's what I mean by the wrong debate. Mainstream news organizations have accepted the conclusions of the IPCC but have not yet applied those conclusions to the economic debate. The terms of that debate have been defined by opponents of climate action who argue that reducing emissions would “cost too much.” So the battle has been fought over the short-term price of climate action and its impact on GDP, while overlooking an extremely important variable, the long-term costs of inaction and business as usual. These costs are difficult to quantify; after all, how does one put a price on rising sea levels, flooded coastal cities, mass extinction of species, widespread drought, famine, and the forced migration of millions of climate refugees? The limits of the cost-benefit approach are revealed in the work of Danish statistician Bjorn Lomborg, the self-styled “skeptical environmentalist” who has become a darling of the deny-and-delay crowd. In 2004, Lomborg claimed that minimizing climate change could lead to an “aggregate \$5 trillion benefit,” while the cost of controlling global warming could run “from \$3 trillion to \$33 trillion.” As a result, he concluded, “the money would be better spent elsewhere.”²⁴ Lomborg was faulted for grossly underestimating the cost impact of climate change. Two years later, a much-criticized report for the British government by former World Bank chief economist Sir Nicholas Stern placed the

cumulative cost of climate inaction in 2050 at a startling 5 percent to 20 percent of global GDP—five to twenty times as much as it would cost to take action.²⁵ Stern's figure may be high; the median projection of the cost of inaction based on 2001 IPCC data is 5 percent.²⁶ Since journalists have accepted the IPCC's conclusions about climate change, they should not ignore its warning about the cost of inaction. It is essential context for this debate, even if the true costs of climate catastrophe are incalculable.

The economic debate over climate policy will shift in the coming year, as a U.S. president who takes the climate threat seriously begins to implement a new agenda. But the economic argument over Lieberman-Warner will shadow the coming debate, with NAM and others continuing to offer their apocalyptic forecasts. The global economic crash and multi-trillion-dollar bailout of the financial sector have led some to argue that the U.S. cannot afford to deal with the climate crisis at this time. But in November 2008, President-elect Obama renewed his pledge to move on the issue, saying he will “start with a federal cap-and-trade system.”²⁷

Obama has begun to craft an optimistic, even transformative argument about the economic benefits of a clean-energy economy. He is trying to reposition climate action not as a cost but as an investment—indeed, as a driver of America's economic revival and a key element in the coming economic stimulus package. This is not a new idea; Amory Lovins, the energy expert and founder of the Rocky Mountain Institute, and many others have long argued against the “prevalent and incorrect assumption,” as Lovins puts it, “that climate protection is expensive. All our experience tells us saving energy is a highly profitable enterprise. So while politicians debate costs, smart companies are

racing to save money and pocket the savings before their competitors.”²⁸

Such assertions make intuitive sense but their particulars will require scrutiny and even skepticism from the press because overly optimistic economic predictions can be almost as damaging as unduly pessimistic ones. Doomsday forecasts are designed to forestall action and preserve the status quo—an impossibility at this point, since climate change is coming whether we like it or not. But rose-colored forecasts can lead to badly designed policies, crushed hopes, unexpected costs, and a backlash that derails progress. The question isn’t whether or not to drive toward a clean-energy future; the climate crisis leaves us no alternative, and common sense tells us that freedom from fossil fuels will be good for us. The question is how best to move forward, choosing policies that provide maximum long-term environmental and economic benefit for the lowest possible cost. Sound analysis can help society make the right choices, and informed journalists can play a crucial role. But there aren’t enough of them to be found.

There is evidence that energy efficiency and renewable energy technologies are more labor intensive than the fossil-fuel industries, so that an investment in clean technology generates more jobs than an equivalent one in the fossil-fuel industries.²⁹ So-called green-collar jobs are already making a difference in the industrial heartland,³⁰ but the opponents of change will surely be back with new economic analyses “proving” that these jobs are chimerical and clean-energy investments are bad for the economy. Last summer, by allowing that kind of fear mongering to masquerade as sound economic analysis, the press let those voices lock the U.S. into the wrong debate. Will journalists make the same mistake again?

Balance as Bias

The American public has reached an important turning point in its understanding of climate change. For a decade or more, the U.S. debate about anthropogenic global warming was prolonged by a well-orchestrated (and by now well-documented) disinformation campaign designed to sow doubt and delay action. The campaign was carried out by a loose coalition of industry associations, corporate-funded think tanks and officials of the George W. Bush administration, some of whom joined the federal government from those private-sector associations. Early in President Bush’s first term, his administration advanced the argument that climate science was not sufficiently settled to warrant mandatory reductions in greenhouse gas emissions; a decade of further study and perhaps some voluntary measures were all that was required.³¹ According to a 2007 report by the Democratic-controlled House Oversight and Government Reform Committee, “the Bush administration has engaged in a systematic effort to manipulate climate change science and mislead policymakers and the public about the dangers of global warming.”³² There is ample evidence to support this conclusion.

In 1998, the American Petroleum Institute, the leading oil industry trade association, produced an internal “Communications Action Plan” that was later leaked to the *New York Times*. The plan stated: “Victory will be achieved when ... citizens ‘understand’ uncertainties in climate science ...[and] recognition of uncertainties becomes part of the ‘conventional wisdom.’”³³ One of API’s “climate team leaders” at the time was a lobbyist named Philip Cooney, who in 2001 became chief of staff at the White House Council on Environmental Quality. In June 2005 the *New York Times* reported that Cooney had

heavily redacted a number of federal reports on climate change in 2002 and 2003. “In a section on the need for research into how warming might change water availability and flooding,” the *Times* reported, “he crossed out a paragraph describing the projected reduction of mountain glaciers and snowpack.” Rick S. Piltz, a former senior associate in the Climate Change Science Program, revealed that U.S. government climate reports had also been edited by Cooney to emphasize doubts about climate change. According to Piltz, Cooney changed one 2002 document to “create an enhanced sense of scientific uncertainty about climate change and its implications.”³⁴

After the scandal broke, Cooney resigned from the Council on Environmental Quality and took a job with ExxonMobil, which provided some \$16 million between 1998 and 2005 to a network of 43 advocacy organizations that seek to confuse the public on global warming science.³⁵ ExxonMobil recently announced that it would stop funding skeptic groups, and has now adopted the position that “climate change is a serious issue and that action must be taken.”³⁶

With vociferous arguments on both sides during the Bush years and disinformation coming from the highest levels of the U.S. government, many news organizations restricted their climate reporting to a facile balancing of opposing views on the subject, even though there was a scientific consensus that carbon emissions were warming the planet in potentially catastrophic ways. In “Balance as Bias,” an influential 2004 study of climate articles appearing between 1998 and 2002 in the *New York Times*, *Washington Post*, *Los Angeles Times*, and *Wall Street Journal*, the academics Maxwell T. Boykoff and Jules M. Boykoff argued that

the prestige U.S. media has contributed in significant ways to failed discursive translations regarding global warming. These press outlets have done this by adhering to the journalistic norm of balanced reporting, offering a countervailing “denial discourse”—a voluble minority view [that] argues either that global warming is not scientifically provable or that it is not a serious issue—roughly equal space to air its suppositions.³⁷

“The press coverage did trail the science,” concedes Andrew Revkin, who broke some of the biggest stories about the Bush administration’s war on climate science. Revkin says that the media caught up with scientific consensus gradually, between 2001 and 2007, as the IPCC’s conclusions became more definitive. Today, climate reporters have moved beyond the basics. Some are delving into technological solutions such as the capture and underground storage of CO₂. Others deal with specific scientific questions on which there is as of yet little consensus—the projected rate of ice melt and sea-level rise, for instance, or the relationship between warming and the frequency and intensity of tropical storms.³⁸

Although a noisy minority of right-wing radio talk show hosts, bloggers, think-tank commentators, and pseudo-scientists still tries to make the case that global warming is a hoax—and 20 percent of the U.S. population tends to agree with them—a majority of Americans now understands that the threat is real.³⁹ The vocal minority will never be persuaded; fortunately, unanimity is not a prerequisite for action. But the tipping point for climate action has not yet been reached. Though more than half of Americans say they favor climate action, only about 20 percent are genuinely educated, active, and “on board” for what needs to be done. The rest don’t re-

alize the urgency or know what the policy options are. There's an obvious need for the kind of public education that good explanatory journalism can provide.

In short, the country has moved beyond the old scientific debate and into a new, equally contentious political and economic one, a huge national argument over what to do about the climate crisis. The climate action coalition has been pushing hard to put a price on carbon—the essential step toward a solution—either through a tax or, more likely, a cap-and-trade system. Climate skeptics who once denied the problem have fallen back to a new position: The earth may be warming and man may be the cause, they say, but the impacts probably won't be as bad as the scientists think, and in any event it would be too costly to do anything about it.⁴⁰ They are wrong again. There are valid economic concerns about cap and trade (it would increase energy costs, especially in the 25 states that get 50 percent or more of their electricity from coal-fired power plants), so it must be designed in a way that cushions price shocks. But so far, groups like the National Association of Manufacturers and the U.S. Chamber of Commerce have not engaged in constructive attempts to improve climate legislation. Instead, they have simply tried to kill it.

Case Study I: National Reporting in Washington

The “modeling wars,” as Environmental Defense Fund media director Tony Kreindler calls the debate over the cost of Lieberman-Warner, began in March 2008, with the release of an Environmental Protection Agency study that examined various cost scenarios, each based on a different set of economic assumptions. The campaign continued through June 5, when a Senate procedural vote killed the bill.

(The truncated debate took place the week Obama clinched the Democratic presidential nomination, so it received scant media attention.)

A word about the weapons in this modeling war. The NAM/ACCF study used the National Energy Modeling System (NEMS) developed by the U.S. Energy Information Administration, one of many that plug in existing economic data, along with assumptions about future economic behavior, to estimate how the economy will respond to policy changes. No one believes they are effective predictive tools. “To be honest,” UCLA economics professor Matthew Kahn has written, “these...models are crap.”⁴¹ Their results are determined in part by the assumptions programmed into them—assumptions about how quickly wind, solar, geothermal, and nuclear power become widely available, and how quickly we perfect the technology to capture and store carbon from coal-fired power plants. If the U.S. fails to bring these technologies into widespread use as cap and trade makes fossil fuels more expensive, prices will shoot up. By plugging in skewed assumptions, combatants in the climate policy wars can make a model spit out just about any result they want. One finds offenders on both sides of the argument. Environmental groups have produced studies claiming that cap and trade would impose no net cost whatsoever;⁴² these are no more credible than the doomsday forecasts. But the arguments over extreme predictions—not the agreement embodied in the emerging economic consensus—tend to make the headlines.

Crossing the bridge to a clean-energy economy requires a leap of faith that new technologies will be ready as the old technologies fade—and it requires a massive, simultaneous investment to accelerate those new technologies. It calls for belief

in the power of innovation, best articulated by the famous “Porter hypothesis,” the 1991 assertion by Harvard Business School professor Michael Porter that “appropriately planned environmental regulations will stimulate technological innovation, leading to reductions in expenses and improvements in quality.”⁴³ You might think that a group representing the manufacturers of America, the source of so much dynamism in our history, would believe in this power. But the NAM/ACCF study is hugely pessimistic about America’s ability to innovate. As Tufts economist Julie A. Nelson concludes in her critique of the study, “It is odd, in many ways, that these industry groups should take an approach that so radically goes against the ideas that markets are powerful, that entrepreneurs respond to market conditions, and that American businesses are flexible and innovative.”⁴⁴

Economist Janet Peace, vice president of markets at the non-partisan, pro-cap-and-trade Pew Center on Global Climate Change, has studied the models and attended the conferences. “There’s not a single modeler that I’ve met who thinks they can predict the price of gasoline in 2030,”⁴⁵ she says. Well, sometimes it seems there is one: Margo Thorning, chief economist of the American Council for Capital Formation, who oversaw the controversial study for the National Association of Manufacturers and traveled the country, presenting her findings with absolute certitude at a series of events sponsored by the U.S. Chamber of Commerce. Her numbers were crunched by the technology consultant Science Applications International Corporation (SAIC), but with “input assumptions provided by ACCF and NAM...[which] do not necessarily represent the views of SAIC,” according to the report.⁴⁶ Crucially, these assumptions included extremely pessimistic adoption rates for alternative energy

sources. For example, NAM/ACCF assumed that imposing a price on carbon through cap and trade would utterly fail to accelerate the adoption of solar power in the United States. In addition, NAM/ACCF’s “Low Cost Scenario” assumes that a maximum of five gigawatts of new wind power would be deployed each year between now and 2030, even though that’s less than the amount of wind power built in 2007.⁴⁷ By Thorning’s dismal reckoning, the pace of our transition to a clean energy economy may have already peaked. “NAM’s takeaway is clear,” says Peace. “If you don’t add any new technology between now and 2030, the cost is going to be a lot higher. They skew the results by keeping technology flat.” The NAM/ACCF study makes other pessimistic choices as well, such as assuming that corporations would for some reason not take advantage of various cost-containment features built into Lieberman-Warner.

Thorning and NAM President John Engler have defended the integrity of the report, saying their assumptions are merely realistic. “Most industry experts do not believe that it will be possible to dramatically change the composition of the U.S. energy supply or the link between energy use and industrial production within the next 15 to 20 years,” Thorning told me via email. “The assumptions used in the ACCF analysis about how quickly carbon capture and storage can be deployed on a commercial basis, how many new nuclear plants can be built, and how much new wind and solar and biomass can be integrated into the electric transmission system in the next decade or two reflect the judgments of industry experts.”⁴⁸

“What we’ve tried to do,” said Engler, the former Michigan governor, “is set a high bar for analysis.”⁴⁹ The NAM/ACCF

assumptions, and Thorning's specific responses to criticism, are presented in more detail in the appendix.

At the Environmental Defense Fund, Peter Goldmark and Nathaniel Keohane knew they needed a weapon of their own in the modeling wars, so they produced a report entitled "What Will It Cost to Protect Ourselves from Global Warming?" Overseen by Keohane, EDF's director of economic policy and analysis, the report was unusual—an attempt by an advocacy group to present what Goldmark called "a dispassionate review" of climate economics. EDF didn't succeed in this attempt; the report wasn't wholly dispassionate and journalists tended to treat it as just another piece of green advocacy. That was understandable but too bad because it was a serious piece of scholarship. Instead of commissioning a new economic analysis whose results miraculously supported EDF's pro-cap-and-trade views, Keohane's report aggregated the findings of respected academic and governmental studies conducted by researchers at Harvard, MIT, the Research Triangle Institute, the Energy Information Administration, and the Pacific Northwest National Laboratory. Since no single economic model can predict the future, EDF highlighted the median projected impact from a range of the best independent research. "We wanted to break through the 'he said, she said' debate," Keohane told me.⁵⁰

His results were encouraging. Under business as usual—with no limits on carbon emissions—the U.S. economy was expected to grow to \$23 trillion by January 2030. With cap and trade in place, the studies found, the U.S. would reach that same level of GDP just three months later, in April 2030. "The most surprising message is how small the overall effects are predicted to be," the report notes.⁵¹ The "business-as-usual models," it

stressed, did not factor in the huge cost of inaction. So the basic choice—action vs. inaction—was really no choice at all.

Part of the game when it comes to the modeling wars is how you choose to express your numbers. Keohane's report uses the very small sounding 0.58 percent of GDP in 2030. Assuming (as EDF does) that GDP will reach \$23 trillion that year, that 0.58 percent hit comes out to \$133.4 billion, which sounds a lot bigger. That's certainly how Thorning would have chosen to present the statistic. Had Keohane been writing her report, of course, he would have expressed her \$669 billion worst-case estimate as 2.7 percent of 2030 GDP, which, spread over 18 years, is an average of 0.12 percent of GDP per year.⁵² Even the doomsday number seems tame when expressed that way, partly because it is: The U.S. economy is so big it can absorb the blow of doing what needs to be done to divert the climate change meteor.

After Goldmark and Keohane presented their report in the April 2008 conference call, they waited to see how reporters would use it. Would these dramatic results from respected sources nudge the media toward the idea that an economic consensus had formed? Would journalists draw a conclusion about who was right and wrong in the cost debate? Not a chance.

EDF gave an advance copy of its report to Steven Mufson at the *Washington Post*, one of the top energy reporters in the country (and one of the few dedicated to the climate beat). But even Mufson isn't immune to the dangers of "he said, she said," reporting, as he demonstrated in his April 20, 2008 piece for the paper's Outlook section. "How much does saving the planet cost these days?" he began.

Listen to John Engler, former Michigan governor and president of the National Association of Manufacturers, and you'll hear that the price...will be far too steep....Then listen to Nathaniel Keohane and Peter Goldmark of the Environmental Defense Fund (EDF), and you'll hear that the cost to the economy would be barely noticeable.⁵³

Who's right? Mufson doesn't say. He cites the results of the EDF study but makes no mention of the study that Engler based his comments on. The NAM/ACCF report casts its shadow over Mufson's story anyway because the reporter quotes Engler, who commissioned it, predicting that cap and trade would shut down "another 1,000-person plant...every month." Instead of helping his readers weigh the two sides, Mufson hurries on, inviting readers to "look beyond this sharp, albeit predictable, divide between the industrialists and environmentalists."

A talented journalist with 25 years of experience, Mufson told me that he believed EDF's study had "integrity" and "was one of the better reports I've seen," while the NAM report "had a lot of problems. They're not equal."⁵⁴ That, he said, was why he decided to mention one and not the other. But here's the problem: Mufson quoted the NAM president's dire job-loss predictions without letting his readers know that NAM's study was based on dodgy assumptions. He withheld information that would have helped his readers draw conclusions about who might be right and wrong in this crucial argument. Why did he present the two views with equal weight if he didn't think they had equal merit? Mufson first told me he didn't want to bury his readers in detail, then admitted to another motive: source preservation. "I didn't want to come down too heavily because I'm going to

keep covering this subject, and I want everyone to keep talking to me," he said. Every journalist has pulled a punch in order to preserve a source. This was an unfortunate time to make that call because Mufson's article was the first big cost-debate story to be published. It helped set the tone for much of the coverage to follow.

"All the coverage was disappointing," says Keohane. "It was 'he said, she said; on the one hand, on the other hand'—that's a cheap way of creating drama. I'd be the first to admit that there is a clearer consensus on the basic science than on the economics, but the economic assumptions are more transparent—it's lazy not to look at them. You just have to scratch the surface to find them!"⁵⁵

After that disappointing beginning, Mufson's article makes a comeback. In fact, it turns into one of the better discussions of the cost debate to be found in the mainstream press because it frames the debate expansively, asking whether the fight against global warming is "a question of setting limits or expanding horizons." Mufson begins with something many reporters overlook, "the cost of doing nothing," citing Sir Nicholas Stern's 2006 report, which placed the cost of inaction at 5 percent to 20 percent of global GDP. Mufson rightly notes that economists have criticized Stern's methodology, but quotes former Federal Reserve chairman Paul Volker expressing the consensus view that while costs of action are "manageable," if we fail to act "there will be very likely great costs." Then Mufson explains how a cap-and-trade system would work, and points out that "no one can say exactly how much the proposed system would cost consumers or industries," citing the unknowable effect of technological innovation driven by the rising cost of fossil fuel. He concludes by nudging his

readers toward a conclusion that he shies away from stating outright: By focusing so closely on the short-term costs of climate action, we are indeed having the wrong debate. Climate change, he writes, “is not just a matter of accounting but one of politics and perspective. Considering that the world will spend more than \$20 trillion on energy projects over the next 25 years, and has already spent between \$1 trillion and \$3 trillion on the Iraq war..., perhaps it’s not a question of what we can afford as much as what our priorities are.”

Case Study II: Local Reporting in Montana

One morning in March 2008, about 150 people gathered in the ballroom of a Billings, Montana, hotel for a “Climate Change Dialogue” hosted by the U.S. Chamber of Commerce and its Montana affiliate.⁵⁶ It was one of a half-dozen such events held in cities around the country as the Lieberman-Warner bill approached the Senate floor, designed to sow fear and rally opposition to the measure. (Another six events were held in the fall of 2008, to do the same for Barack Obama’s climate policies.) “We are not here to talk about whether climate change is happening,” said Montana Chamber President Webb Brown as he kicked things off. “We are simply here to talk about the potential cost of legislation to deal with climate change, especially how it will affect Montana businesses and Montana families.”

Billed as a dialogue, the event was actually more of a serial monologue. It presented exactly one side of the issue. Its star was Margo Thorning, presenting the NAM/ACCF analysis—customized for the state of Montana—with clinical detachment, enormous confidence, and eyebrow-raising specificity: between 11,000 and 15,000 Montana jobs would be “lost” by

2030, she said, not explaining that her findings represent a slower rate of economic growth, not a loss of existing jobs. “Our study does reflect that there will be an increase in green jobs,” she conceded, “but on balance...there will be overall job loss. We will lose energy-intensive jobs. There will be cutbacks in production, loss of productivity, a shift of energy intensive jobs to outside the U.S.”

Sharing the bill with Thorning was a representative from the American Petroleum Institute, an official from a local electric utility, and a man named George Landrith, who identified himself as a member of the “American Environmental Coalition” but is better known as an unsuccessful Republican Congressional candidate from Virginia who runs the Frontiers of Freedom Foundation, an ExxonMobil-funded group that opposes environmental regulations. (Landrith made the case that the climate isn’t changing, and even if it were, man isn’t causing it.) No one from a climate policy group, an environmental organization, or the renewable-energy industry was invited to participate. Audience questions were kept to a minimum, and both the \$50 admission fee and the site chosen for the event seemed designed to limit the number of activists in attendance. (Billings, one of the most conservative cities in Montana, is 150 miles from the resort towns clustered around Yellowstone Park.)

According to Webb Brown of the Montana Chamber, Thorning’s NAM/ACCF report was the second study that the U.S. Chamber provided to its Montana affiliate. “First they came with a report that said Lieberman-Warner would cost Montana 52,000 jobs,” Brown told me.⁵⁷ “We said, ‘that’s almost 10 percent of all jobs in the state—seems a little extreme.’ Then they said, ‘Never mind. We’re going to replace that report with Margo Thorn-

ing's.” The original report, prepared for the industry association Edison Electric Institute (EEI) by Charles River Associates, was widely criticized for distorted assumptions that made its cost and job-loss projections especially severe. It was so extreme that some members of the utility industry, which bankrolled the report, even distanced themselves from it. The CEOs of eight electric utilities sent a letter to EEI a week before the Montana event, saying the report's exaggerations should be fixed. “In the revised analysis,” the CEOs remarked drily, “we believe that it will be important to accurately estimate the costs.”⁵⁸

The fact that the CRA report had been discredited didn't prevent it from being used to scare people at the Montana Climate Change Dialogue. George Landrith trotted it out during his remarks. “Fifty-two thousand jobs lost in Montana—that's a lot of jobs,” he said. “Fifty-two thousand jobs! Real economic pain for no climate gain.” He called cap and trade “an Enron-style profiteering scheme” that would result in “no climate benefit” while costing the average Montana family \$5,400 per year in higher costs. “My guess is we'd cut out things like piano lessons, dance lessons, or little league or summer camp,” he said, tugging hard at the heart-strings. “The idea of saving for college for your kids—that's gone.”

That evening, Aaron Flint of KTVQ News, the CBS affiliate in Billings, reported on the Climate Dialogue with a piece almost as one-sided as the event. Flint said the Chamber had found that Lieberman-Warner “would lead to 3,000 to 5,000 job losses in Montana. That's on top of electricity bills they say could rise over 100 percent by 2030.” He did not challenge the findings and offered but one skeptical voice, an aide to Montana governor Brian Schweitzer, who said the

Chamber was “kind of like the cigarette companies...saying smoking is good for you.”⁵⁹

In a front-page story the next morning, reporter Mike Stark of the *Billings Gazette* did a better job of putting the NAM/ACCF claims in context. At first, Stark reproduced the basic argument without seeking resolution. “Depending on whom you talked to Wednesday,” he wrote, “a proposal aimed at cutting U.S. carbon emissions will either have dire consequences for Montana's economy or will create ample business opportunities that also better the environment.”⁶⁰

Stark cited Thorning's incendiary job-loss and electricity-cost predictions but added that they “were quickly dismissed by environmentalists, Gov. Brian Schweitzer's office, Montana economists, and others....Critics of the study said it overstates the economic costs and understates the benefits.” Stark also mentioned the uncertainties inherent in economic forecasts, and made the fairly sophisticated point that Thorning's analysis did not predict that existing jobs would be destroyed, but that the rate of future growth would be slowed. He pointed out that “what's also not being calculated is the cost of doing nothing about global warming, which, in Montana, could lead to increased wildfires,...changes in irrigation and agriculture practices, more beetle-killed trees, and other damages.” Finally, he pointed out George's Landrith's climate-skeptic beliefs and gave the last word to former Billings mayor Chuck Tooley, a well-known local proponent of climate action. Tooley had a parting shot for Landrith. “He's from upside-down land,” the former mayor said. “I wasn't sure if he was serious or not.”

Billings Gazette readers were well served by Stark's work. He didn't attempt to resolve

the debate, but he did provide smart context, accurately portraying the Chamber's climate conference as a battleground of ideas and helping readers understand that studies like Thorning's are weapons of persuasion—mirrors of the present, not windows on the future. As the Chamber's road show moved on and the debate unfolded in Washington, that fairly low bar turned out to be one that few national reporters would clear.

Case Study III: The Senate Floor Debate

When the Senate began debating the Lieberman-Warner bill on June 2, there was no doubt that Republican opponents would use economic scare tactics to kill the bill. Lieberman-Warner would see to it that “people must turn off air-conditioning in the summer,” said Jon Kyl of Arizona; it would “attack citizens at the pump” and “increase job losses” (Saxby Chambliss, Georgia); it would “leave us less competitive in the world market” (Jeff Sessions, Alabama) and “bankrupt U.S. air carriers” (Jon Thune, South Dakota).⁶¹

The economic assault was so furious and unified, in fact, that counter-arguments from the bill's sponsors could scarcely be heard above the din. In the press, prophecies of doom were often quoted without questioning, as if weapons of political combat don't require fact checking. One low point: a *Dallas Morning News* story, from wire reports, headlined “Detractors say anti-pollution bill before Senate could lead to \$8 gas,” which quoted a NAM official as saying “we're bankrupting our economy” if the bill passes, and predicted “the economic hit to Texas could force companies to cut as many as 335,000 jobs to pay for added costs.”⁶² This conclusion went far beyond even the NAM/ACCF worst-case projection, which was that

335,000 future jobs would not be created in Texas over the next two decades, not that any jobs would be “cut.”

The nation's best newspaper was not above publishing some credulous work of its own. On June 3, the central GOP talking point—“climate bill equals higher gas prices”—basically became the lede of a *New York Times* story. The “raucous debate,” political reporter John M. Broder wrote, “will put supporters of the bill, including all three presidential candidates, on the spot—essentially forcing them to come out in favor of high energy costs at a time when American consumers are paying record fuel prices.”⁶³ Broder quoted Oklahoma Sen. James Inhofe, who famously believes global warming is a hoax, saying that “any [Senate] action should not raise the cost of gasoline.” But Broder did not point out that according to the EPA, Lieberman-Warner might cause the price of gasoline to rise by just \$0.53 by 2030—less than three cents per year.⁶⁴

The next day, Broder handed off to his colleague David M. Herszenhorn, who filed a story that carried the idea of floor-debate-as-dress-rehearsal to its logical extreme. Herszenhorn's story was essentially a theater review, full of colorful rhetoric and senatorial performance. He quoted Inhofe on Oklahoma's cold winter last year, on a purported “list of 30,000 scientists” who say there's no major connection between CO₂ and global warming, on alleged inaccuracies in *An Inconvenient Truth*, and on the IPCC, “which has been totally refuted and refuted many times.”⁶⁵ None of this was fact-checked. (As for Inhofe's accuracy, let's concede that Oklahoma was cold last winter). Herszenhorn transcribed testy exchanges between Inhofe and Sen. John Kerry, between Sens. Arlen Specter and John Tester, and he quoted Sen. Barbara Boxer—champion of the bill and chairman of the Environ-

ment and Public Works Committee—rhapsodizing about “a beautiful creature, the polar bear.” It was a fun read, but it conveyed nothing of value about the issue at hand. Some have made the case that since the Lieberman-Warner bill was destined to go down in flames, there was no reason to take the substance of it seriously. That might be arguable if there weren’t so much at stake, and if the *Times* didn’t aspire to—and so often achieve—a far higher standard. But disposable beats make for disposable stories.

One debate wrap-up story managed to have some fun with senatorial theatrics while holding specious claims up to the light of day. “Global Warming Numbers Game Confounds Debate,” by Deirdre Shesgreen of the *St. Louis Post Dispatch* (June 8), began with a quotation from the late Stanford University statistician Lincoln Moses: “There are no facts about the future.” The line, Shesgreen suggested, was an apt description of the Lieberman-Warner debate. “One side predicted the bill would cause economic doom-and-gloom, the other forecast a bright and rosy future replete with new technology and green jobs....Such spin is nothing new in Washington, where consultants earn fat fees to come up with talking points, strategy memos and ‘facts’ to fit any partisan viewpoint.”⁶⁶ But Shesgreen didn’t stop there. She went deeper, drilling down on the dire warnings from her home state’s senior senator, Republican Kit Bond:

More than 76,000 Missourians would lose their jobs over the next two decades. Energy costs would climb by 153 percent. The average Missouri household would face an extra \$6,852 a year in costs. Bond made the predictions Monday, as debate began.... “The Lieberman-Warner bill, regrettably, has a particularly unfair and harsh

impact on America’s heartland,” Bond said.

Shesgreen explained that Bond got his numbers from the NAM/ACCF report, and let readers know that it was based on dodgy assumptions:

Bond’s figures on Missouri job losses and energy costs came from a national study conducted by American Council for Capital Formation, a conservative business-backed think tank whose supporters have included the American Gas Association, ExxonMobil Corp., and Ford Motor Co., among others. The council’s study of the Lieberman-Warner bill was done in coordination with the National Association of Manufacturers, a major opponent of the global warming bill. The study’s findings predict much higher costs than other models, according to compilation of analyses by the Electric Power Research Institute. Critics say the study low-balled projections about the availability of renewable energy power and clean-coal technology, among other things....Howard Grunspecht, the deputy administrator of the federal Energy Information Administration, said the study also seemed to mix the impact of high oil prices with the effects of the global warming bill, skewing the results.

Then Shesgreen gave the rosy projections of the bill’s proponents the same treatment. She quoted Sen. Joe Lieberman predicting a dramatic decrease in oil imports if his bill was passed. “Down 58 percent, 6.4 million barrels a day, the lowest amount of imported oil in this country since 1986,” he declared.

For his forecasts, Lieberman cited the International Resources Group, a consulting firm whose...analysis of the

bill was done for the Natural Resources Defense Council, a major supporter of the bill. The group's study predicts, among other things, that renewable energy sources will produce 50 to 60 percent of the country's electricity supply. "No one in their right mind believes we will go to generating 50 percent of our power from wind and solar," Bond quipped during Wednesday's debate. The reality, say independent experts, is that no one can accurately determine the impact of such a far-reaching, complicated proposal.

Virtually alone among those covering the debate, Shesgreen then pointed out that despite the uncertainties, there is a consensus among economists about the cost of cap and trade. For that she turned to Professor Robert N. Stavins, director of Harvard's Environmental Economics Program, who laid out the baseline argument.

The cost of enacting a cap-and-trade system... "is not going to be free, it's not going to be a job-creation strategy," Stavins said. At the same time, "it's not going to bankrupt the economy or send the economy into a recession." The effect on gas prices, for example, will be "very small" compared to the recent run-up caused by changes in global supply and demand, Stavins said. Then there's the cost of not doing anything about global warming, which proponents of the Senate bill argued could be much higher than the cost of any new regulations. And perhaps more unpredictable, too.

Without playing favorites or becoming an advocate, Shesgreen managed to be a tough, even-handed referee and to get the big picture right. Her story didn't linger over the economics or get lost in the

weeds. It simply did the job. More stories like hers might have made the Lieberman-Warner debate a fairer fight.

Conclusion

Reflecting on the civil rights struggle of the 1960s in a recent lecture at the Kennedy School of Government, Georgia Congressman John L. Lewis praised the American press for its coverage of the movement, calling the press a "sympathetic referee in the struggle for social justice." When one side of a national debate carries with it such compelling, unambiguous moral authority, he suggested, the human beings who make up the media have no choice but to take sides. "Without the press," he said, "the civil rights movement would have been like a bird without wings."⁶⁷

The climate crisis represents another such moment in our public life. But I would argue that this time the press must *not* allow itself to become a "sympathetic referee." It should be sympathetic only to the idea that solutions must be found and that further delay is intolerable. Beyond that, what's needed isn't sympathy but honesty—a referee who calls it straight. The press has an obligation to remain clear-eyed and skeptical because with the policy issues so complex and the stakes so high, we can't afford to get this wrong. Well-crafted legislation can reduce emissions while encouraging job creation, while a bad bill could drive investment out of the energy sector yet fail to reduce emissions. Reporters need to learn the difference between sound economic analysis and weapons of mass persuasion.

As opponents of climate action continue to trot out the same reports, they are trying to reposition them as mainstream wisdom. A recent blog post on the Web site of the National Association of Manufac-

tures, for example, presents the NAM/ACCF study as the moderate voice, positioning it between the discredited CRA report and EDF's study.⁶⁸ Journalists ought not to be fooled.

Thanks to Obama's optimism about the economic benefits of a clean-energy economy, the debate is now shifting from the short-term economic pain of climate solutions to the long-term economic gain. And clean energy will be a boon—once alternative-energy technologies become widely available and costs come down for wind, solar, and other clean fuels. In the meantime, however, energy prices are likely to rise in a carbon-constrained world. There's plenty of room for optimism as we consider issues that economists can't quantify, such as how rapidly ingenuity and innovation can deliver this new economic reality. But it's worth keeping in mind that for political reasons, the opponents of change will exaggerate the costs of action while the proponents of change minimize those costs. At an energy conference last summer, former president Bill Clinton described "what was billed as a very hopeful study," which concluded that solving the climate crisis would cost one percent of global GDP. "If that's our line," said Clinton, "we're gonna lose."⁶⁹ So the new line is that cap and trade will help generate jobs. This is a political argument—a piece of advocacy—as much as an economic one. Is it true?

"The path to a low-carbon economy is the higher-growth path," says Nathaniel Keohane of EDF. "But I don't think we're going to have a free lunch. I don't think we need to sell cap and trade as a jobs-stimulus package. Sure, it will create jobs, but will it create more jobs than business as usual over the next five years? Probably not. My best estimate of the net effect is zero. But what it will do is spur the economy to create the right jobs."⁷⁰

That's not an argument in favor of the status quo. It's the voice of an economist who works for an environmental group remaining stubbornly honest about his forecasts, even if they're not fully in tune with the green jobs choir. As Keohane sees it, we need to accept slightly higher short-term costs in exchange for cost reductions and a clean-energy economy further down the line. "The answer to \$4 a gallon gasoline isn't putting our heads in the sand because the solution will raise prices by 20 cents over 20 years," he says. "The answer is to get us off gasoline."

Will the public accept that kind of grown-up analysis? I believe it will. But it falls to the press to be an honest broker in this debate—sympathetic to the idea that change must come, yet rigorous in its analysis of competing claims. No one can repeal the laws of economics, so there are going to be costs associated with climate solutions. The burden on consumers can be mitigated—and here's a fertile field for reporters to till—through an idea called "cap and dividend," which uses some proceeds from a cap-and-trade system's auction of pollution permits to send rebate checks to consumers, offsetting the impact of higher energy prices.

What's the best way to engineer such a rebate? Should it be means-tested or universal, as Alaska's oil dividend is? These and other questions are being debated in policy circles and the blogosphere, which is a locus of informed climate policy analysis (along with plenty of lurid, climate-denial fantasies). Some of the best sites are produced by respected nonpartisan sources such as the Pew Center on Global Climate Change (www.pewcenter.org), others by fiercely partisan experts like Joseph Romm of the Center for American Progress (www.climateprogress.org). Trade press sites such as Energy and Environment

News (www.eenews.com) offer highly informed reporting and analysis for those willing to pay the subscription fee. The Web sites of mainstream media outlets also feature strong work—Andrew Revkin’s Dot Earth on www.nytimes.com, Keith Johnson’s Environmental Capital on www.wsjournal.com—in part because they assume a level of reader knowledge and interest that their print papers may not. The task now is to translate the Web’s passionate, wonkish debate in ways that engage a general reader.

To do that, individual journalists must master the nuances of the story and devise ways to present them to readers. Since this

is a big, ugly war with trillions of dollars at stake, that shouldn’t be too hard. There’s plenty of conflict for journalists to snack on. But the central problem confronting climate policy reporters cannot be solved by climate policy reporters. That problem is the choice news organizations have made not to devote the necessary manpower and column inches to the climate policy story. Top editors need to decide that this will no longer be a disposable beat. Until that happens, the press will continue to underreport the story of the century: the race to save the planet from a meteor known as humankind.

Appendix

To inform this discussion, research assistant Matthew Homer and I reviewed a sample of wire service, newspaper, and newsmagazine articles about the cost of climate action. We excluded opinion columns and blog postings. Though the progressive blogosphere provides some of the best analysis of climate policy, it is a place of full-throated advocacy, and we were interested in the predicament of mainstream reporters trying to cover the issue while obeying their inner admonition not to take sides. We evaluated news accounts of the Senate floor debate in June, to see how arguments presented there percolated into the coverage. Finally, we analyzed economic studies and interviewed reporters, editors, economists, and representatives of NGOs and industry groups.

Content Analysis of News Reports

Category 1: One-Sided, Lacking in Balance (7 Stories)

“Detractors say anti-pollution bill before Senate could lead to \$8 gas,” *Dallas Morning News*, June 1, 2008.

R.A. Dillon, “Stevens, Murkowski Worried About Climate Change Legislation,” *Fairbanks Daily News-Miner*, June 4, 2008.

Gannett News Service, “Senate Poised to Take Up Sweeping Global Warming Bill,” May 16, 2008.

Erika Loveley, “Coal groups mine tech funding before going green,” *Politico*, May 20, 2008.

John Myers, “Climate Change Issue Hits Home,” *Duluth News Tribune*, May 30, 2008.

Pam Sohn, “Corker says new energy policy would affect nation ‘in many, many ways,’” *Chattanooga Times Free Press*, April 8, 2008.

W. Terry Smith, “ElectriCities Against More Regulation,” *The Daily Southerner*, Tarboro, N.C., March 10, 2008.

Category 2 - Nominally Balanced: “He Said, She Said” with Little Analysis or Context (24 Stories)

Jeffrey H. Birnbaum, “‘Wynn-Win’ for K street, loss for the public?,” *Washington Post*, April 1, 2008.

John M. Broder, “Senate Opens Debate on Politically Risky Bill Addressing Global Warming,” *New York Times*, June 3, 2008.

Matthew Brown, “Business groups campaign against climate change bill,” Associated Press, March 19, 2008.

Gail Russell Chaddock, “Economic risks imperil climate bill,” *Christian Science Monitor*, June 5, 2008.

Zacharie Coile, "GOP Tries to Scuttle Climate Change Bill," *San Francisco Chronicle*, June 4, 2008.

Bob Davis, "World News: IMF weighs in on costs of greenhouse-gas cutback," *Wall Street Journal*, April 4, 2008.

"Trading dirt—pollution law," *Economist*, June 7, 2008.

H. Josef Hebert, "Senate panel takes global warming bill," Associated Press, December 5, 2007.

H. Josef Hebert, "Higher energy costs from climate bills," Associated Press, April 29, 2008.

David M. Herszenhorn, "More Talking than Listening in the Senate Debate About Climate Change," *New York Times*, June 5, 2008.

David M. Herszenhorn, "After Verbal Fire, Senate Effectively Kills Climate Change Bill," *New York Times*, June 7, 2008.

Stephen Koff, "Voinovich, Brown agree in opposition to Lieberman-Warner legislation to fight global warming," *Cleveland Plain Dealer*, May 5, 2008.

Dave Kolpack, "In North Dakota, experts disagree on benefits of global warming bill," Associated Press, March 19, 2008.

Jad Mouawad, "Industries allied to cap carbon differ on the details," *New York Times*, June 2, 2008.

Stephen Power, "Washington battle over climate change heats up—Senators stake out stances in debate of 'cap-and-trade'," *Wall Street Journal*, June 3, 2008.

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Category 3 - Beyond “He Said, She Said”: Balanced with Context and Analysis (9 Stories)

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Juliet Eilperin and Steven Mufson, “Climate Bill Underlines Obstacles to Capping Greenhouse Gases,” *Washington Post*, June 1, 2008.

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NAM/ACCF Economic Assumptions

The NAM/ACCF study purports to be a cost/benefit study of the Lieberman-Warner Climate Security Act, but as many others have pointed out, it considers only costs, and ignores the benefits of climate action. Similarly, the study generally considers the bill’s impact on current carbon-producing energy sources, while ignoring the technological improvements and acceleration of renewable energy production that would result from the price incentives and investments in the bill.

Here’s a look at how the NAM/ACCF assumptions compare with those of alternative studies and baseline business-as-usual projections:

Nuclear: [NAM/ACCF](#) assumes the generating capacity of nuclear energy would grow by 10 to 25 GW by 2030 under a Lieberman-Warner cap-and-trade regime. The [Department of Energy](#) (DOE), which employs the same NEMS model used by NAM/ACCF, projects 17 GW of capacity being added by 2030 in its business-as-usual reference case—without the

Lieberman-Warner legislation. In DOE's "core" impact scenario under Lieberman-Warner, it assumes 268 GW of capacity being added by 2030, and even in its more restrictive "high cost" scenario, it assumes 88 GW of capacity coming online by the same year. [The Clean Air Task Force](#) also uses the NEMS model and assumes that without the Lieberman-Warner bill, nuclear capacity will increase 13 GW by 2030. With Lieberman-Warner it assumes a capacity growth of 104 GW by 2030, pointing out that 27 GW of new capacity is already planned or under construction. It says that in order to meet its projection, it would only require growing the nuclear energy sector at the same rate experienced by the U.S. between 1971 and 1990. The [Environmental Protection Agency](#) (EPA) and [Duke University](#) have both produced studies placing the growth of nuclear energy somewhere between NAM/ACCF and the two previously mentioned studies: 44 GW of new generating capacity by 2025 for EPA and 63 GW of new generation by 2030 for Duke.

Wind: The NAM/ACCF assumptions underestimate the potential growth of wind power. NAM/ACCF assumes that between 3 and 5 GW of new wind generation will be added annually, when 5 GW were added last year. The [Energy Information Agency](#) (EIA) is similarly pessimistic, placing current generation at 3 GW and predicting it will reach a total of only 14 GW by 2030. Neither of these assumptions takes into account technological improvements that are already underway. The traditional challenge for wind energy has been that although it has enormous generative capacity, it has only been able to generate up to a third of its capacity as a result of mechanical limitations and inconstant wind flows. According to the DOE, however, average capacity factors for wind turbines have increased by 11 percent over the past 2 years; DOE projects that capacity factors will improve by another 15 percent over the next two decades. In its core scenario on Lieberman-Warner, DOE assumes that renewables will add 112 GW of capacity by 2030 and that the majority of that increase will be made up by wind. DOE has also presented more ambitious projections in [a plan](#) that would add 300 GW of capacity 2030. Clean Air Task Force assumes a wind power with a generating capacity of 85 GW by 2030, with 54 GW of new generation being added between 2010 and 2030.

Carbon Capture and Sequestration: The NAM/ACCF assumptions for Carbon Capture and Sequestration (CCS) are also highly restrictive. The study only considers the sequestration of natural gas and gasified coal and assumes each individually could only add between 25 to 50 GW of generation by 2050. The [Pew Environment Group](#) describes this in the following way: "Coal is treated in a manner different than the bill prescribes, leading to double-counting of increased coal costs. Combined with restrictions on integrated gasification combined cycle (IGCC) power development, this leads to very little use of coal in the model." In its analysis of Lieberman-Warner, the Clean Air Task Force assumes CCS would add 133 GW of capacity by 2030, Duke University assumes 50 GW of new generation by 2030, the EPA assumes 145 GW of new capacity by 2030, and the Department of Energy puts added capacity at 64 GW by 2030.

Biomass: The NAM/ACCF biomass assumptions are difficult to assess since other studies lump this energy source with other renewables and don't indicate its relative weight within that category. According to [EIA](#), biomass currently generates 6.2 GW of energy each year; by 2030 it is expected to generate 19.3 GW. NAM/ACCF assumes biomass would add between 3 and 5 GW a year.

Solar: One glaring choice in the NAM/ACCF assumption set is the decision to assign solar and solar thermal energy no additional growth beyond what it would enjoy in the baseline “business as usual” scenario. EIA projects just 0.9 GW of energy generated from solar/photovoltaic by 2030. [Clean Edge](#) puts solar capacity at 255 GW by 2025. And the [Solar Energies Industry Association](#) argues that the southwestern United States is capable of generating 7,000 GW of electricity with solar thermal, but for the short-run argues that adding 80 GW of capacity by 2030 is a realizable objective.

Process Assumptions: Mechanical assumptions are equally problematic in the NAM/ACCF study. For example, it assumes firms will not [bank](#) allowances even though this cost-containment provision was part of the Lieberman-Warner bill. The [Congressional Research Service](#) explains that “the ACCF/NAM/NEMS cases do not include banking: this fact helps explain their dramatically increasing allowance prices. All other cases include banking.” The study also caps carbon offsets at 20 percent even though the Lieberman-Warner legislation caps them at 30 percent.

Margo Thorning Comments on NAM/ACCF Assumptions

Margo Thorning, senior vice president and chief economist at the American Council for Capital Formation, argues that the assumptions used in the NAM/ACCF analysis of the Lieberman-Warner bill were realistic, not unduly pessimistic. In an email exchange,⁷¹ she pointed out that one of the alternative scenarios in the U.S. EPA’s analysis of the bill, Scenario Number 7, “uses assumptions almost identical to those in the ACCF analysis and shows losses in GDP quite similar to those in the ACCF/NAM study.” This is true; EPA ran those dire assumptions at the request of Oklahoma Senator James Inhofe, the climate-skeptic ranking Republican on the Environment and Public Works Committee. The EPA scenario that most resembles the provisions in Lieberman-Warner, however, produced results similar not to those of NAM/ACCF but to the mainstream economic consensus highlighted by the EDF April 2008 report. Additional responses from Thorning are presented below without further comment:

The ACCF/NAM/SAIC analysis does assume that new technologies will be adopted and that energy efficiency will increase over the 2012–2030 period included in our analysis. For example, the study assumes that the contribution of solar photovoltaic and solar thermal is the same as that in the baseline case and so the difference (relative to the baseline) is zero. The AEO 2007 Reference Case has modest growth in both: solar thermal growing from 0.54 GW in 2008 to 0.63 GW in 2030; and solar photovoltaic growing from 0.05 GW in 2008 to 0.39 GW in 2030. With technology capital cost for solar thermal at \$3,886 (\$2008)/kw and solar photovoltaic at \$4,837 (\$2008)/kw, the NEMS model selects less costly technologies to generate electric power.

Janet Peace’s comment about the ACCF study keeping technology growth flat is erroneous. The NEMS model does incorporate efficiency improvements based on trend growth in technology and expected trajectory of energy prices. Instead of looking at efficiencies of individual sectors or individual pieces of equipment, the best way to get a feel for efficiency improvements is to look at the energy/GDP ratio. In

the AEO 2007 Reference Case, the energy GDP ratio falls from 8.6 (1,000 btu)/\$GDP (\$2008) in 2008 to 5.8 in 2030. This decline clearly indicates that the economy is getting more efficient. In the ACCF analysis the decline in the energy GDP ratio falls from 8.6 to 4.8 in 2030 in the high cost cast, for example.

Most macroeconomic analyses of the impact of GHG reduction proposals do not measure the environmental benefits of the reductions. However, in its 2008 analysis of S.2191, EPA did measure (off line) the global environmental benefits in 2095 if the U.S. achieved the Lieberman-Warner targets. EPA concluded that unless developing countries like China and India sharply reduce their emission growth, there will be virtually no reduction on concentrations of GHGs (page 192 at http://www.epa.gov/climatechange/downloads/s2191_EPA_Analysis.pdf.) Thus, if the U.S. and other developed countries adopt stringent GHG emission reduction targets but developing countries do not participate, there is no environmental benefit.

The ACCF/NAM study did not incorporate banking. Given the projected increase in economic growth, population and in demand for energy, it seems unlikely that much banking will occur. New data from the U.S. DOE-EIA project that U.S. energy consumption will rise by 13 percent between 2009 and 2030. (See http://www.eia.doe.gov/oiaf/aeo/pdf/aeo2009_presentation.pdf for latest EIA estimates on energy demand). The inherent uncertainty about whether given climate change policy will remain in place or whether new technologies may arise that cut the cost of reducing emissions will also tend to make companies hesitate to sacrifice current production for possibly illusory future benefits.

Regarding the future role of renewables in the U.S. energy supply, the new DOE-EIA data referenced above also project that fossil fuels will be 79 percent of U.S. energy production in 2030 and that non-hydro renewables share will increase only marginally.

Endnotes

¹ Mankind-as-meteor has become a powerful meme. I first encountered it in Eric Roston, *The Carbon Age*, New York: Walker and Company, 2008, p. 188. Peter Goldmark at EDF and others have used the suppose-climate-change-were-a-meteor formulation in conversation, and an article in the December 18, 2008 issue of *The Economist*, published after I submitted this paper, begins, “Imagine that some huge rocky projectile, big enough to destroy most forms of life, was hurtling towards the earth...” See also numerous Web citations, including “Q&A with Thomas Friedman,” *Brown Daily Herald*, April 23, 2008, www.brown.edu/Departments/Brown_Is_Green/documents/QandAwithThomasFriedman.pdf.

² Kelly Sims Gallagher, “Acting in Time on Climate Change,” Harvard Kennedy School Conference paper, September 18–19, 2008. <http://belfercenter.ksg.harvard.edu/actingintimeonenergy/papers/gallagher-climate.pdf>.

³ “Analysis of the Lieberman-Warner Climate Security Act,” a report by the American Council for Capital Formation and the National Association of Manufacturers, <http://www.accf.org/pdf/NAM/fullstudy031208.pdf>.

⁴ The NAM/ACCF study has been the subject of widespread criticism. See Julie A. Nelson, “How Costly is Climate Change Mitigation? A Methodological Critique of the ACCF/NAM Claims,” Global Development and Environment Institute, Tufts University, March 18, 2008. http://www.e3network.org/resources/How_Costly_ACCFNAM2008.pdf and Janet Peace, “Insights from Modeling Analyses of the Lieberman-Warner Climate Security Act,” Pew Center on Global Climate Change. www.pewclimate.org. Telephone interview with Janet Peace, chief economist, Pew Center, December 9, 2008.

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⁶ <http://www.uschamber.com/press/ads/default>; <http://www.americaspower.org/News/Ad-Archive>.

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⁹ Keohane and Goldmark, p. 11.

¹⁰ Interview with Robert N. Stavins, director of the Harvard Environmental Economics Program, November 24, 2008.

¹¹ Interview with Robert N. Stavins.

¹² “See Andrew C. Revkin, Dot Earth blog, <http://dotearth.blogs.nytimes.com/2008/08/13/slate-columnist-find-the-arguments-in-climate-science/>.

¹³ Peter Goldmark, EDF Conference Call, April 21, 2008.

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¹⁵ Eban Goodstein, “Polluted Data,” *The American Prospect*, November 30, 2002.

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- ¹⁶ Daniel J. Weiss and Nick Kong, “Fool Me Twice, Shame on Me,” Center for American Progress, April 15, 2008. http://www.americanprogress.org/issues/2008/04/electricity_rate.html.
- ¹⁷ Interview with Andrew C. Revkin, December 5, 2008.
- ¹⁸ I am indebted to Cristine Russell, science journalist and senior fellow at the Harvard Kennedy School Belfer Center for Science and International Affairs, for her insights on climate journalism.
- ¹⁹ <http://www.ipcc.ch/>.
- ²⁰ Study by Maxwell Boykoff and Maria Mansfield, Oxford University, reported by Andrew C. Revkin, <http://dotearth.blogs.nytimes.com/2008/12/05/back-to-media-trance-on-climate/>.
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- ²³ Curtis Brainard, “Environmental S.W.A.T. Team,” *Columbia Journalism Review*, January 13, 2009. http://www.cjr.org/the_observatory/environmental_swat_team.php
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- ³² <http://oversight.house.gov/story.asp?id=1653>.
- ³³ <http://oversight.house.gov/story.asp?id=1653>.
- ³⁴ <http://www.sourcewatch.org>.
- ³⁵ http://www.ucsusa.org/news/press_release/ExxonMobil-GlobalWarming-tobacco.html.
See also <http://www.sourcewatch.org/index.php?title=ExxonMobil>.
- ³⁶ Ken Cohen, Vice President of Public Affairs, ExxonMobil, in a conference call with environmental bloggers, January 26, 2007, <http://watthead.blogspot.com/2007/01/climate-change-conversations-with.html>.
- ³⁷ Boykoff & Boykoff, p126.

³⁸ On these matters, the press tends to offer loud headlines and simplified stories that don't help readers understand the natural evolution of scientific inquiry: the offering of a hypothesis, the testing and revision of that hypothesis. Overheated reporting leads to what Revkin has called "journalistic whiplash": a wave of stories suggesting that global warming has "caused" a hurricane, followed by a wave of stories casting doubt on that linkage. The result is a confused readership that wonders if any of this stuff can be believed.

³⁹ There is a surfeit of polling data on climate change, some of it contradictory. Generally, public concern has waned slightly since its 2006–07 peak, especially among conservatives. According to an April 2007 *New York Times*/CBS News poll, a large majority—90 percent of Democrats, 80 percent of Independents, and 60 percent of Republicans—said they favored "immediate action" to combat global warming, as long as it didn't mean higher gasoline prices. (*New York Times*, April 27, 2007.) In the 2008 Climate Values Survey by ecoAmerica, 90 percent of Democrats, 73 percent of Independents, and 54 percent of Republicans agreed with the statement, "I am convinced that global warming is happening." But in that study, only 18 percent expressed strong agreement with the entire logic chain that global warming is real, that man is responsible, and that it is harmful. http://www.ecoamerica.org/docs/ecoAmerica_ACVS_Summary.pdf.

⁴⁰ John P. Holdren, "Convincing the Climate-Change Skeptics," *Boston Globe*, August 4, 2009.

⁴¹ Matthew E. Kahn, Environmental and Urban Economics blog, <http://greeneconomics.blogspot.com/2008/06/should-californias-arb-trust-computable.html>.

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⁴⁴ Julie A. Nelson, p. 8.

⁴⁵ Telephone interview with Janet Peace, December 9, 2008.

⁴⁶ "Analysis of the Lieberman-Warner Climate Security Act," ACCF/NAM, p.3.

⁴⁷ Janet Peace, "Insights," p.7.

⁴⁸ Margo Thorning email, January 8, 2009.

⁴⁹ Brenda Krebs and John Dorschner, "Experts Debate Costs of Climate Control," *Miami Herald*, March 13, 2008.

⁵⁰ Interview with Nathaniel Keohane, September 3, 2008.

⁵¹ Keohane and Goldmark, p. 7.

⁵² The difference in growth rates implied by the NAM study is 0.12 percentage points per year. To arrive at that figure, we started with the actual figure for US GDP in 2007 (the latest full year available; the NAM figures were in constant 2007 dollars, so this is an apples-to-apples comparison). That was \$13,807 billion. The NAM GDP estimate for 2030 in the baseline scenario was \$24,674 billion, which represents an annual growth rate of 2.52%. The NAM GDP estimate for 2030 in the "High Cost" scenario is \$24,005 billion, which represents an annual growth rate of 2.40% from 2007. The difference is 0.12 percentage points. Note that we computed the growth rate starting in 2007 because the NAM study does not report GDP in an initial year (e.g. 2012); it first reports GDP in 2014 but by then there is already an estimated GDP reduction. Indeed, a curious thing about the NAM study is that a lot of the impact happens right away—the growth rates from 2014 to 2030 are actually closer (2.55% in the baseline vs. 2.48% in the high-cost scenario). That may reflect a number of assumptions that front-load the impacts to make the short run seem scarier.

⁵³ Stephen Mufson, “Is This Green Enough? We can clean up our act, but it’ll cost us,” *The Washington Post*, April 20, 2008.

⁵⁴ Interview with Mufson.

⁵⁵ Interview with Keohane.

⁵⁶ I attended the Montana Climate Change Dialogue, held at the Billings Crowne Royal Hotel, March 19, 2008. Quotations from the public proceedings are taken from my audio recording of the event.

⁵⁷ Interview with Webb Brown, March 19, 2008.

⁵⁸ John Dorschner, “Utility execs: Global warming fix not that pricey,” *Miami Herald*, March 6, 2008.

⁵⁹ Aaron Flint, “Chamber of Commerce Sounds Alarm on Climate Legislation,” KTVQ, March 19, 2008, <http://www.montanastation.com>.

⁶⁰ Mike Stark, “Carbon Plan Debate: Boon or Disaster?” *Billings Gazette*, March 20, 2008.

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⁶⁶ Deirdre Shesgreen, “Global Warming Numbers Game Confounds Debate,” *St. Louis Post Dispatch*, June 8, 2008.

⁶⁷ Rep. John L. Lewis, Theodore White Lecture, Harvard Kennedy School, November 20, 2008.

⁶⁸ <http://www.chamberpost.com/2008/12/this-just-in-again-climate-policy-will-not-be-cheap.html>.

⁶⁹ Bill Clinton, National Clean Energy Summit, Las Vegas, Nevada, August 19, 2008.

⁷⁰ Interview with Keohane.

⁷¹ Thorning email.