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EDITORS' NOTE

Global climate change affects human lives. Low-income communities, people of color, and indigenous societies are particularly affected by social and cultural disruptions, impaired health, and unjust financial burdens. In every country, city, and town across the globe, the poor suffer more than the affluent from the effects of global climate change. In U.S. cities, wealthier citizens mitigate the effects by their choices in jobs and housing. They can afford to relocate or insure their property and their health. They work and live in air-conditioned offices that shut out bad-pollution days, and not on construction sites or in contaminated neighborhoods. Low-income Americans are three times more likely to die from respiratory ailments and two times more likely to die from a heat wave than their wealthier neighbors. Around the world, the effects of climate change are felt disproportionately by poorer countries, especially those at the equator and the poles. Lack of infrastructure and resources constrain their ability to cope with the consequences. Yet, they are the least likely to have contributed to the greenhouse gas emissions that caused them.

Global climate change is among the most compelling and complex concerns of today. As world leaders struggle to address this issue, the disproportionate impact on the poorer communities of the world must be part of their discourse. The climate change policies that are adopted, whether at the local, state, regional, national, or global level, must address this disparate impact. Whether shaping policies related to greenhouse gas emissions, transportation, housing, energy production, or industry, policymakers must consider the effects of these policies on poorer communities.

The *Denver University Law Review* Symposium "Global Climate Change: Integrating Environmental Justice into Policy, Regulation, and Litigation" was held on February 15, 2008. The Symposium brought together some of the most distinguished scholars and practitioners in this field to discuss how lawyers concerned with climate change and social justice can raise these issues in shaping legislation, influencing regulation, and pursuing litigation. The articles in this Issue are a result of that inspiring and powerful discourse.

First, Colorado State Attorney General John Suthers' keynote address takes the position that activist state attorneys general have overstepped their roles in pursuing many of the climate change cases, primarily due to their political ambitions. Next, Professor Federico Cheever explores the lawyer's role in addressing global warming and reminds us to think like a lawyer in finding the parties responsible and holding them accountable. Professor Alice Kaswan's article describes California's

efforts to do just that, and proposes a cooperative federalist structure in which the states and the federal government can work together.

Professor Anita Halvorssen discusses the issue on a global scale, analyzing the international agreements, their effectiveness, and amendments anticipated when the world leaders meet in Copenhagen in 2009. Next, Professor Sarah Krakoff explores the disproportionate impact of climate change on Native Americans, who contribute very little to global warming but suffer its effects in a particularly painful way because of their cultural attachment to the land.

Professor Marilyn Averill reviews how the courts have dealt with climate change issues, emphasizing that these types of cases allow examination of ethical and social issues within the particular factual context of a legal case. Professor James May examines how the courts have used the political question doctrine to avoid hearing these cases and argues that the doctrine should not serve as a bar to judicial resolution.

Professor Gary Bryner then describes the market's failure to account for carbon emissions and argues that capturing these costs in the price of goods is essential to improving the quality of our environment. Professor Robert Hardaway discusses the inputs to the climate change equation and argues that while certain economic policies such as a carbon tax or a cap-and-trade system may have some effect on reducing greenhouse gases, we may be just "rearranging deck chairs on the Titanic" until we get population growth under control. Finally, Professor Ved Nanda uses the European Union's Gas Emissions Trading Scheme as a template for a market-based solution that can provide incentives for curbing greenhouse gas emissions.

We are honored to have these contributors to this Issue of the Law Review. We would also like to thank the other speakers that participated in the Symposium. Luke Cole, Director of the Center for Race, Poverty, and the Environment, began our Symposium with the fascinating and heartrending story of the Inupiat people in the tiny Alaskan village of Kivalina. Their simple way of subsistence living from hunting and fishing is being destroyed by climate change, and they are pursuing compensation in the courts. Other speakers made excellent contributions to our panels: Robert R. Nordhaus, Member, Van Ness Feldman, LLC, Washington, D.C.; Vickie Patton, Deputy General Counsel, Environmental Defense Fund; Eric Toder, Ph.D., Senior Fellow, Urban Institute, Senior Staff, Urban-Brookings Tax Policy Center; Professor Ed Ziegler, University of Denver Sturm College of Law; and our other keynote speaker, Jim Holtkamp, Manager of both the Global Climate Change and Environmental Practice Groups at Holland & Hart LLP.

The 2008 Symposium would not have been as successful without the support and contributions of many people at the University of Denver Sturm College of Law. Professor Cheever, who was our Symposium

advisor and host, provided much-appreciated advice and guidance throughout the process. We would also like to thank the faculty members who served as moderators of the Symposium panels: James van Hemert, Director, Rocky Mountain Land Use Institute; Professor Robert Hardaway, University of Denver Sturm College of Law; Jay Tutchton, Director, Environmental Law Clinic, University of Denver Sturm College of Law; Professor Cheever, University of Denver Sturm College of Law; and Professor Mark Hughes, University of Denver Sturm College of Law. In addition, our Assistant Symposium Editors, Adam Aldrich, Page Crowther, and Joshua Nathaniel, were instrumental in putting each of the panels together. Thank you also to the various staff members at the Sturm College of Law that helped with logistics and marketing, especially Continuing Education Consultant Giselle Diaz, Director of Events Lauri Mlinar, and Law Review Office Coordinator Gracie Aguirre. We also appreciate the financial support and sponsorship of the Rocky Mountain Mineral Law Foundation and the law firm of Holland & Hart LLP. Finally, we also thank Michael Smith, Justin Curry, and Forrest Plesko, incoming Editor-in-Chief, Managing Editor, and Senior Articles Editor, for their hard work in preparing this Issue.

Rebecca J. Wilkins
Symposium Editor

Erik Lemmon
Editor-in-Chief

THE STATE ATTORNEY GENERAL'S ROLE IN GLOBAL CLIMATE CHANGE

JOHN W. SUTHERS†

Thank you for the invitation to join you and participate in this law review Symposium on a very timely topic. While I have no scientific expertise whatsoever on the subject of global climate change, as a state attorney general I do have some knowledge about the legal efforts of various state AGs to deter global warming. So I will discuss that and, perhaps in doing so, inject a point of view into the Symposium that will be sufficiently controversial to spice things up a little bit.

You should know that, while I take pride in the fact that I can and do work effectively with both sides of the political aisle and that I believe I have been successful conducting the work of the Colorado Attorney General's Office on the basis of what the law requires as opposed to what politics suggests, I am, nevertheless, a pretty conservative Republican. I am a big fan of capitalism and market economics. Given my philosophical bent, it may not surprise you that I have not seen the Al Gore movie, "An Inconvenient Truth" and that I do not presently subscribe to the "sky is falling" school of thought when it comes to global warming. But while I do not personally keep a carbon score card and purchase carbon credits, I do accept as fact that the earth has experienced a discernable warming over the last several decades. Whether it is due to increased human-generated greenhouse gas emissions or is a cyclical event of the sort the earth has previously experienced, I suspect I am less certain about than most of the rest of you here today. But I am convinced that the emission of large amounts of carbon dioxide and other pollutants into the atmosphere is not a good thing for the environment and, therefore, I am wholly supportive of efforts by public policy makers to curb such pollution. And, to the extent greenhouse gases are causing global warming, we should do something about it.

So that leads me to the essence of my remarks this afternoon. What should be the proper role of *state* attorneys general in regard to global climate change? I will first give you my answer to that question, and then elaborate on my response. I believe the proper role of state attorneys general in combating global warming is to enforce the civil and criminal laws passed by their respective state legislatures to protect environmental quality, to cooperate in the enforcement of federal laws designed to combat the problem, to contest federal positions that are con-

† Colorado State Attorney General.

trary to states' rights and principles of federalism, and to properly represent the state health and environment agencies that are clients of the state attorney general.

Now as self-evident as that may sound, I would suggest to you that my view of the proper role of state AGs in this effort would be regarded with some disdain by a few of my AG colleagues, and certainly so among many environmental groups in this country who believe that state AGs have the very broad authority and responsibility to act in whatever the AGs believe is the broader public interest, whether or not they are statutorily vested with the authority to do so. You see, as to the state attorneys general, the global warming debate is a microcosm of a much larger debate about the proper role of state attorneys general. Let me frame the debate for you by alluding to my own experience.

When I was sworn in as attorney general of Colorado in January of 2005, I understood my role would be significantly different than my work as a district attorney or as United States Attorney. Those public offices did virtually nothing but litigation. The district attorney's office prosecuted criminal cases and had limited civil jurisdiction in consumer protection and public health areas. As U.S. Attorney, my office did all the criminal and civil litigation for the United States in the District of Colorado. As attorney general, I understood I would be legal advisor to all departments, agencies, boards, and commissions in Colorado State government. My office would issue legal opinions, both formal and informal, on a wide variety of subjects pertinent to the operation of the State. I also understood I would be involved in a broad range of civil litigation on behalf of the State of Colorado, both as plaintiff and defendant, in addition to the criminal prosecution responsibilities I had had.

But as to my role as the protector of the broad public interest, primarily in regard to Colorado's civil and criminal statutes relating to consumer protection and environmental protection, I still saw myself as assuming the familiar role of a law enforcer. In fact, I would be the chief law enforcement officer in Colorado. It would be my job to enforce criminal and civil laws passed by the state legislature to protect consumers from fraud and deception and to enforce a variety of statutes enacted to protect the public from air and water pollution and other health hazards.

And I do not believe I was naïve. I was well aware that state attorneys general had been involved in some controversial litigation, including the massive civil suit against tobacco companies that had culminated in a settlement agreement in 1999 involving as much as $240 billion,[1]

1. *See* NATIONAL ASSOCIATION OF ATTORNEYS GENERAL, MASTER SETTLEMENT AGREEMENT, *available at* http://www.naag.org/backpages/naag/tobacco/msa/msa-pdf/1109185724_1032468605_cigmsa.pdf.

and that many free market conservatives questioned whether that was a proper exercise of the State police power.[2] I knew that several attorneys general, like Eliot Spitzer of New York, had made quite a name for themselves taking on corporate America, and that many on Wall Street and elsewhere thought they were overreaching. No, I was not naïve, but neither was I fully prepared for what I found when I joined the ranks of state attorneys general.

In March of 2005 I attended my first meeting of the National Association of Attorneys General (NAAG) in Washington, D.C. In the weeks prior to the meeting I was flooded with invitations to go to elegant private dinners and social receptions hosted by law firms for various interest groups while I was in Washington. That is not something that occurred when I went to district attorney or U.S. Attorney meetings. I was also invited to a meeting of the Republic Attorneys General Association (RAGA), which would take place the day before the NAAG meeting. I was informed that the Democrat attorneys general would be attending a meeting of DAGA, the Democrat Attorneys General Association. I learned that many companies and interest groups contributed to both RAGA and DAGA. I recall being a bit perplexed. What was the propriety and necessity of such an effort to influence attorneys general?

When I came into the room for my first NAAG meeting, the scene looked very much like what I experienced at National District Attorneys Association meetings and at meetings where all the U.S. Attorneys got together. Tables were assembled to create a rectangle and a name card and a Colorado State flag marked the place I was to sit. But when the NAAG president called the meeting to order, I noticed that, in addition to the attorneys general sitting around the table, there were about 150 people sitting at tables in the rear of the room. I whispered to a colleague sitting adjacent to me. "Who are all the people in the back?" I asked. He glanced at me in a way to suggest it was a dumb question and then smiled. "They're here to lobby you," he said.

And indeed they were. I found that the attorneys general are subject to intense lobbying in much the same fashion as legislators. But instead of seeking your vote, the lobbyists are hoping that you will or will not sign on to *amicus curiae* briefs in the appellate courts, or more importantly, that they can convince you to refrain from initiating or joining a lawsuit against their company or their interests. In rare instances, an attorney general will be encouraged to join a litigation that is regarded as helping the lobbyist's client. Lobbyists spend a great deal of time and money educating attorneys general about various issues that may become fodder for litigation in the future. Interest groups are now investing mil-

2. Michael DeBow, *Restraining State Attorneys General, Curbing Government Lawsuit Abuse*, POLICY ANALYSIS, May 10, 2002, *available at* http://www.cato.org/pubs/pas/pa437.pdf.

lions of dollars in attorney general races in the various states in an attempt to protect their interests.

How did it come to this? Fifteen years ago no one cared much about state attorney general races. There was no RAGA and DAGA. NAAG meetings were quiet affairs largely free from outside pressures. A few of my attorney general colleagues who had held office for a long time lived through the transition and probably have a better perspective than mine. But from what I have been able to ascertain and personally observe, the current situation is a confluence of interrelated trends. The bottom line is that state attorneys general have become more litigious, more high profile, and more politically ambitious. Precisely in which order these occurred or which trend led to others, I am not certain. But I do know that the current situation coincides with a phenomenon knowledgeable observers refer to as attorney general "activism."

Now what exactly is attorney general activism? Is it capable of definition or is it simply a case of "you know it when you see it"? Let me give you a few "I knew it when I saw it" examples and then try to define it.

In the aftermath of Hurricane Katrina in 2005, gas prices rose sharply. The public was angry, perceiving that the rise in price was more the result of corporate opportunism than market forces. The state AGs, all wanting to be perceived as diligent problem solvers, weighed in with their concerns. The Federal Trade Commission (FTC) and several AGs initiated investigations.[3] Colorado had initiated gas pricing investigations in approximately eight out of the previous dozen years.[4] I distinctly recall a nationwide phone conference in which the FTC gave the AGs a preview of the report they were issuing the next day. Essentially, the FTC found no systematic wrongdoing.[5] It concluded that the rise in prices was attributable to market forces, including the highly volatile spot and futures markets.[6] Various AG investigations reported similar

3. FEDERAL TRADE COMMISSION, INVESTIGATION OF GASOLINE PRICE MANIPULATION AND POST-KATRINA GASOLINE PRICE INCREASES (2006), *available at* http://www.ftc.gov/reports/060518PublicGasolinePricesInvestigationReportFinal.pdf; *see, e.g.*, CONSUMER PROTECTION UNIT CIVIL LITIGATION DIVISION, STATE OF IDAHO OFFICE OF THE ATTORNEY GENERAL, REPORT ON POST-HURRICANE KATRINA GASOLINE PRICES IN IDAHO, *available at* http://www2.state.id.us/ag/newsrel/2006/GasReport2006.pdf; CALIFORNIA STATE ATTORNEY GENERAL BILL LOCKYEAR, REPORT ON GASOLINE PRICING IN CALIFORNIA, UPDATE MARCH 2004, *available at* http://ag.ca.gov/antitrust/gasoline/pdf/gasoline.pdf; STATEMENT FROM THE OFFICE OF THE ILLINOIS ATTORNEY GENERAL LISA MADIGAN, RISE IN GAS PRICES INVESTIGATED IN WAKE OF HURRICANE KATRINA, *available at* http://www.illinoisattorneygeneral.gov/consumers/gas_prices.html#more_info.

4. *See, e.g.*, ATTORNEY GENERAL SALAZAR ANNOUNCES RESULTS OF YEAR-LONG GAS PRICE FIXING INVESTIGATION IN GRAND JUNCTION AREA (2000), *available at* http://www.ago.state.co.us/press_detail.cfm?pressID=536.

5. *See* FEDERAL TRADE COMMISSION, *supra* note 3, at viii.

6. *Id.*

conclusions.[7] I thought that would be the end of the matter and expected the phone call to wrap up quickly. But a veteran attorney general from the Midwest interjected and made what I considered an amazing assertion. In fact, I had to write it down. "Just because we haven't found anything illegal, doesn't make it right and doesn't mean we shouldn't do anything about it," he said. "We need to do something about these obscene profits."

Folks, that is the mindset of an activist AG. Luckily, market forces shifted a short time later and attorney general interest in the issue declined at the same rate as gas prices.

As to AG activism on the issue of global warming, let me cite you to two cases. In 2006, shortly before he left office, California Attorney General Bill Lockyer filed suit against the world's six largest car makers.[8] In this suit California sought to recover damages for all environmental damage caused by automobiles since their invention.[9] In *California v. General Motors Corp.*, it was California's contention that cars are a "public nuisance" the manufacturers inflicted upon it.[10] The suit ignored the fact that the California legislature long ago passed the nation's strictest auto emission standards and that the companies had specially equipped a significant portion of their fleet in order to comply with those standards. The suit also did not deal with the reality that California constructed an enormous highway system to accommodate this alleged public nuisance. The suit was eventually dismissed by the federal district court in the fall of 2007 on the grounds it raised political questions outside the jurisdiction of the courts.[11] Folks, I believe this was a case of AG activism.

Several Eastern attorneys general, including Eliot Spitzer and his successor Andrew Cuomo, do not like coal fired power plants. So Spitzer, Richard Blumenthal in Connecticut, and several fellow state AGs sued the nation's five largest coal burning utilities, even though none of the utilities were located in their states.[12] In *Connecticut v. American Electric Power Co., Inc.* the AGs sought a reduction in carbon dioxide emissions.[13] The AGs viewed these emissions as a public nuisance and claimed they needed to bring the case because the federal government and coal burning utility companies had failed to implement any

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7. *See* CONSUMER PROTECTION UNIT CIVIL LITIGATION DIVISION, *supra* note 3, at 50-51; CALIFORNIA STATE ATTORNEY GENERAL BILL LOCKYEAR, *supra* note 3, at 2-3; STATEMENT FROM THE OFFICE OF THE ILLINOIS ATTORNEY GENERAL LISA MADIGAN, *supra* note 3, at paras. 2-3.

8. Complaint, California v. General Motors Corp., 2007 WL 2726871 (N.D. Cal. Sept. 17, 2007) (No. C06-05755 MJJ).

9. *Id.* at *2.

10. *Id.*

11. California v. General Motors Corp., No. C06-05755 MJJ, 2007 WL 2726871 (N.D. Cal. Sept. 17, 2007).

12. *See* Connecticut v. American Elec. Power Co., Inc., 406 F. Supp. 2d 265 (S.D.N.Y. 2005).

13. *Id.* at 260.

meaningful measures to address this matter of national and worldwide significance.[14] The U.S. District Court in the Southern District of New York dismissed the action as raising non-justiciable political questions.[15]

Ladies and gentlemen, therein lies the rub. Unlike some of my colleagues, I do not believe that state AGs have the authority to act in whatever they believe is the broader national or international interest and to usurp the jurisdictional authority of Congress and federal regulatory agencies in the process. I believe many of these are in fact political or policy questions to be resolved by legislative bodies.

I also believe basic principles of federalism are being undermined. Over the last year, Andrew Cuomo, Eliot Spitzer's successor as Attorney General of New York, has taken creative legal steps in an attempt to deter new coal fired utility plants in Kansas and Colorado. To me, the notion that the attorney general of New York has the jurisdictional authority to attempt to block utility plants in Kansas and Colorado is an affront to the most basic tenets of federalism. If the attorneys general of a few Eastern states want to control carbon emissions in Colorado and Kansas, they need to lobby the legislators and regulators in those states and/or fight and win battles in Congress that will result in national air quality standards applicable to every state. Otherwise, they should leave it to the people of Colorado to regulate their own utilities. And incidentally, the new coal fired utility unit in Colorado had been approved as part of an agreement between industry and environmentalists because two older coal units would also be retrofitted as part of the deal and the three of them together would have less total emissions than the two currently operational units.

My definition of AG activism is this: It is when a state attorney general attempts to remedy a real or perceived problem through means other than that intended by those elected to make public policy. My test in determining whether to exercise state power to sue someone is simply this: Has a law been violated and is there sufficient evidence to prove it in court? I will not bring a legal action to stop conduct if a legislature has not provided me a means to do so either by express statutory authority or by statutory recognition that I retain certain common law powers.

Now, do I lobby the legislature if I believe they should change the law and give me broader jurisdiction? You bet I do. Do I join multi-state actions? You bet I do, if I believe the defendant has violated Colorado law. For example, we recently caught pharmaceutical companies whose patents on certain products were about to expire paying off potential generic competitors to stay out of the market. That is a violation of the anti-trust laws of Colorado and a multi-state action is a very efficient

14. *Id.* at 271.
15. *Id.* at 274.

and effective means to resolve it. In fact, culpable corporate defendants often view this as the preferred method for resolution of such issues.

The aggressive litigation posture taken by some of my fellow state attorneys general has led critics to question whether they are engaged in a violation of the separation of powers. By using perceived common law powers to achieve public policy objectives they deem desirable, they are, in essence, legislating and regulating by litigation. They are shaping public policy, traditionally the legislative function. But the consent decrees by which they resolve the litigation and secure policy changes are not subject to either legislative or executive approval.

The aggressive litigation pursued by the state AGs has caused them to assume a much higher public profile. Mainstream media have generally reported the attorney general activism favorably and many attorneys general have assumed a populist image that plays very well with voters. State attorneys general are now routinely running for higher office. That in turn has, in my opinion, attracted more lawyers who have primarily a political background rather than a legal background, to run for the office. It is very common now for successful state legislators to run for attorney general. They may or may not have extensive legal backgrounds in prosecution or in the private sector. Not surprisingly, in many of the meetings I have been in with fellow attorneys general that included discussions of actual or potential litigation or expressions of frustration about social or economic problems facing the country, some of my brethren sound a lot more like policy-making legislators than law-enforcing prosecutors.

So the bottom line is this: When it comes to commencing litigation, whether environmental or otherwise, I still believe my only appropriate consideration should be whether Colorado law has been violated or whether federal law gives me jurisdiction to pursue prescribed remedies. I believe attorneys general should seek to solve problems only through remedies provided by the Constitution and by the legislature of their respective state or by Congress. That can include common law remedies the legislature recognizes within the attorney general's jurisdiction. I do not believe it is appropriate for attorneys general to pursue consumer protection or environmental litigation that does not derive from constitutional or legislative authority, but rather represents the attorney general's personal view of what constitutes the broad public interest. By the way, in utilizing available state and federal legislative remedies, including the Comprehensive Environmental Response, Compensation, and Liability Act,[16] my office is engaged in a significant amount of environmental litigation to protect air and water quality in Colorado.

16. *See* 42 U.S.C. § 103 (2006).

And to emphasize that these jurisdictional issues are not simple ones, I will tell you that my office is willing, if directed by our clients in the executive branch, to join California, New York and other states in suing the federal government to preserve the right of states to set emission standards for cars purchased and driven in their state. Regardless of my personal views as to the wisdom of doing so, I believe that is a proper exercise of state power. I also acknowledge that it was the right of several states to sue the Environmental Protection Agency and challenge its determination that it lacked authority under the Clean Air Act to regulate carbon dioxide as a pollutant.[17] That was a question that needed to be answered and I saw the suit as an acknowledgement that this is a problem that needs a national and international solution.

Ironically, I believe some of my more activist colleagues are facing the prospect of losing some front page exposure. I am pleased that it appears the federal government is becoming more engaged in the global warming debate and what to do about it. If there is a coherent national policy on the issue, it is my hope that my state brethren will be less tempted to run roughshod over the basic framework of federalism. But then again, I would not be surprised to see the Attorney General of California or the Attorney General of New York up the ante in the near future and bring a suit against China and India. After all, why should international boundaries stand in the way of what they believe is good for the citizens of California or New York? When you want to be governor, senator, or perhaps President, sometimes your ambition knows no boundaries.

17. *See* Massachusetts v. EPA, 127 S. Ct. 1438 (2007).

EVERYONE COMPLAINS ABOUT THE WEATHER, BUT NO ONE EVER DOES ANYTHING ABOUT IT: INTERJURISDICTIONAL FAILURE TO DESIGNATE RESPONSIBLE PARTIES FOR THE CLIMATE CRISIS

FEDERICO CHEEVER†

INTRODUCTION

The evolving response to the approaching climate crisis challenges the assumptions on which many groups of policymakers rely to make sense of the world around them. It has dramatically broadened our notion of what constitutes an environmentally significant transaction. It has altered our view of the relationship between developed and developing countries.[1] It shows every sign of transforming our notions of international governance and, within the United States, our ideas of federalism.[2] In biodiversity preservation, it has called into question the "reserve system strategy," which has been—without question—the dominant approach to preservation for decades.[3] It may alter our understanding of the meaning of justice. The whole thing makes us dizzy.

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† Professor of Law and Director of the Environmental and Natural Resources Law Program, University of Denver Sturm College of Law. I would like to thank the editors and staff of the *Denver University Law Review*, particularly Erik Lemmon, Editor-in-Chief. I would also like to thank my research assistant Dulcinea Hanuschak without whom this essay would have been impossible.

1. Cinnamon Carlarne, *Climate Change—The New "Superwhale" in the Room: International Whaling and Climate Change Politics—Too Much in Common?*, 80 S. CAL. L. REV. 753, 767-70 (2007) (discussing the refusal of major greenhouse gas emitters—the developed U.S. and the rapidly developing China and India—to embrace emissions restrictions, unlike many European countries); Paul G. Harris, *The European Union and Environmental Change: Sharing the Burdens of Global Warming*, 17 COLO. J. INT'L ENVTL. L. & POL'Y 309, 315-19 (2006) (discussing developing countries' desire to be treated as equals with developed countries during international climate change negotiations, and the philosophical differences in how developed and developing countries view the greenhouse gas problem: that is, that developed countries see it as an environmental problem while developing countries see it as a human-welfare concern).

2. Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159, 177-81 (2006) (opining that an effective means of addressing climate change is to maintain "overlapping" state and federal jurisdiction over environmental issues); Kirsten H. Engel, *The Dormant Commerce Clause Threat to Market-Based Environmental Regulation: The Case of Electricity Deregulation*, 26 ECOLOGY L.Q. 243 (1999) (explaining that state market-based environmental regulations could potentially result in Commerce Clause violations and suggesting means by which states may be able to carry out efficient market-based environmental regulations without risking constitutional violations); Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is It "To the Bottom"?*, 48 HASTINGS L.J. 271, 359, 367-69 (1997) (discussing the need for some form of federal environmental regulation in order to avoid the tendency of some states to impose relaxed environmental standards so as to increase their competitive edge in interstate industry).

3. *See generally* CLIMATE CHANGE AND BIODIVERSITY (Thomas E. Lovejoy & Lee Hannah eds., Yale Univ. Press 2006) (describing climate change biology in light of social concerns, conservation, and public policy); Cornelia Dean, *The Preservation Predicament*, N.Y. TIMES, Jan. 29, 2008, at F1 ("Conservation organizations that work to preserve biologically rich landscapes are

Lawyers, as a profession, have been particularly disoriented by this dramatic change in the shape of the projected future. Our traditional skills seem quaint in a world of impending global cataclysm and prospective gee-whiz technology. Faced with the unknown we are, as always, prisoners of popular culture. Lawyers—as lawyers—never play a significant role in disaster movies. The best we have ever been able to hope for in the face of an asteroid strike, alien epidemic, or monster from the deep is the authority that comes from the fact that most elected officials are lawyers.[4] Legal skills have never seemed important when the fictional President or Prime Minister decides to evacuate New York or calls out the army to stop Godzilla. This image of lawyers in times of fictitious disaster has shaped the legal academic response to the real climate crisis: We exercise our judgment, playing economist,[5] social scientist,[6] moral philosopher,[7] atmospheric scientist,[8] or all four, as we consider what to do, but we do not "lawyer."

However, lawyers—as lawyers—are central to fashioning a response to the climate crisis not only for our judgment and ability to give inspiring speeches in times of crisis but also for our traditional legal habits of mind. When we, as lawyers, face a new threat or cost that society will bear we endeavor to: (1) identify responsible parties to bear that cost; (2) identify mechanisms to spread that cost equitably among those responsible parties; and (3) identify measures to reduce that cost to the

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confronting a painful realization: In an era of climate change, many of their efforts may be insufficient or beside the point.").

4. LEE HANNAH ET AL., BIODIVERSITY AND CLIMATE CHANGE IN CONTEXT, CLIMATE CHANGE AND BIODIVERSITY 3, 7-13 (Thomas E. Lovejoy & Lee Hannah, eds., Yale Univ. Press 2005); Dean, *supra* note 3, at F1.

5. *E.g.*, Ari Bessendorf, *Games in the Hothouse: Theoretical Dimensions in Climate Change*, 28 SUFFOLK TRANSNAT'L L. REV. 325, 347-49 (2005) (describing the problem of greenhouse gas emissions in terms of market systems and game theory).

6. *E.g.*, Kirsten H. Engel, *Mitigating Global Climate Change in the United States: A Regional Approach*, 14 N.Y.U. ENVTL. L.J. 54, 60-62 (2005) (opining that while state efforts to reduce greenhouse gas emissions appear irrational when examined under standard economic theory, other motivations have nonetheless caused some state and local governments to take action to reduce emissions).

7. *E.g.*, Mary Christina Wood, *Keynote Address: Government's Atmospheric Trust Responsibility*, 22 J. ENVTL. L. & LITIG. 369 (2007) (opining that the government has a moral trust responsibility to protect the environment from a "climate emergency"); Mary Christina Wood, *Nature's Trust: A Legal, Political and Moral Frame for Global Warming*, 34 B.C. ENVTL. AFF. L. REV. 577, 598, 603 (2007) (discussing the seriousness of global warming and suggesting that the government has a moral obligation to protect the environment).

8. *E.g.*, William C. Burns, *Global Warming—The United Nations Framework Convention on Climate Change and the Future of Small Island States*, 6 DICK. J. ENVTL. L. POL'Y 147, 150-66 (1997) (discussing the scientific causes of global climate change and the validity of computerized climate models for forecasting the effects of climate change); William C. Burns, *The Second Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change: More Heat than Light?*, 8 COLO. J. INT'L ENVTL. L. & POL'Y 153, 154-56 (1997) (discussing the scientific basis for the greenhouse effect).

degree possible. On items two and three, we are wise to work with experts in other disciplines. On item one, we tend to ride alone.[9]

To date, the legal debate regarding climate change has been driven largely by items two and three in the list above: the search for mechanisms to spread costs among responsible parties and measures to mitigate those costs. It has deemphasized, most remarkably at the federal level and the international level, the identification of responsible parties.

The identification of responsible parties, however, is an essential first step toward any workable legal mechanism. Both the processes of identifying mechanisms to spread cost and measures to reduce cost depend, to a significant degree, on identifying who is responsible, why they are responsible, and what they can do about it.

Professor Daniel Farber initiated a related inquiry in his 2007 article *Basic Compensation for Victims of Climate Change.*[10] However, his preliminary discussion focused primarily on using existing liability doctrines as tools for providing compensation for the victims of the climate crisis. In contrast, I suspect that the unprecedented nature of the crisis will force the evolution of unique theories of responsibility, whatever traditional labels we endeavor to affix to them. Without a doubt, legislatures (international, national, and intra-national), will play an essential role in shaping the structure of responsibility. Courts undoubtedly will play a role as well. They will engage in a complex dance that defies easy prediction.

As Professor Farber observes, "[t]he tort system—and, by extension, other compensation schemes—has several goals. Probably the two most important are deterring harmful conduct (the efficiency or deterrence rationale) and corrective justice (that is, restoring moral balance by rectifying harm)."[11] These policy considerations extend beyond compensation schemes to any structure of responsibility. Questions of "deterrence" and "corrective justice" cannot be answered without identifying responsible parties.

Still, there is a temptation to treat climate change as "the weather": to treat climate change as something which is no one's responsibility and, therefore, to treat its consequent costs—be they costs of prevention or adaptation—as something we should all bear equally. In fact, the responsibility for the climate crisis does not fall equally on all entities in society and we should not pretend that it does. Some entities have

9. *See* Palsgraff v. Long Island R.R. Co., 162 N.E. 99, 101 (N.Y. 1928) (holding that a party is not liable for negligence unless damage was caused by a reasonably foreseeable risk).

10. *See generally* Daniel A. Farber, *Basic Compensation for Victims of Climate Change*, 155 U. PA. L. REV. 1605 (2007).

11. *Id.* at 1640.

gained far more from the creation of the current crisis than most of us. Some entities have far more power to stop or limit it.

This temptation to treat climate change as the weather—and thereby sever our discourse about it from the designation of responsible parties—may explain the wild popularity of tradable permit ("cap and trade") programs as proposed legislative solutions. In more than four decades of environmental law, the United States Congress has mandated only one national cap and trade program for pollutants—the sulfur dioxide trading regime initiated in Title IV of the Clean Air Act Amendments of 1990.[12] However, as far as I have been able to ascertain, every significant national legislative proposal to deal with climate change is built around a cap and trade system. Others, including Al Gore in his Nobel Lecture in December 2007,[13] have compared the effectiveness of cap and trade systems with the effectiveness of carbon tax proposals (and found carbon tax proposals superior).[14] I am interested in the designation of responsible parties. In my frame of reference, tradable permit schemes are significant primarily as a symptom of our desire to avoid designating responsible parties.

Among political structures in the United States, it is the states[15] that have been willing to start the inquiry into what to do about the climate crisis with the process of identifying responsible parties.[16] In public nui-

12. 42 U.S.C.A. § 7651 (West 2008) (establishing the sulfur dioxide trading program). *See generally* Peter Berck & Gloria E. Helfand, *The Case of Markets Versus Standards for Pollution Policy*, 45 NAT. RESOURCES J. 345 (2005) (discussing the sulfur dioxide permitting process instituted by Title IV of the Clean Air Act); Jeffrey M. Hirsch, *Emissions Allowance Trading Under the Clean Air Act: A Model for Future Environmental Regulations?*, 7 N.Y.U. ENVTL. L.J. 352 (1999) (examining the context and effectiveness of the Title IV legislation).

13. Al Gore, Nobel Lecture, Oslo (Dec. 10, 2007), *available at* http://nobelprize.org/nobel_prizes/peace/laureates/2007/gore-lecture_en.html ("And most important of all, we need to put a *price* on carbon—with a CO_2 tax that is then rebated back to the people, progressively, according to the laws of each nation, in ways that shift the burden of taxation from employment to pollution. This is by far the most effective and simplest way to accelerate solutions to this crisis.") (emphasis added).

14. Christina K. Harper, *Climate Change and Tax Policy*, 30 B.C. INT'L & COMP. L. REV. 411, 454-60 (2007).

15. According to the magnificent climate change litigation chart prepared by Arnold & Porter under the direction of Michael Gerrand, there also have been two instances of common law tort litigation involving climate change. The two cases, *Comer v. Murphy Oil USA, Inc.*, No. 1:05-CV-436 (S.D. Miss. 2006) (dismissed August, 2007) (appeal pending) and *Korsinsky v. EPA*, 2005 WL 2414744 (S.D.N.Y. 2005) (dismissed), *aff'd* 2006 WL 2255110 (2d Cir. 2006), were summarily dismissed. *See* html:http://www.arnoldporter.com/resources/documents/Climate_Change_ Litigation_Chart_123107.mht!Climate_Change_Litigation_Chart_123107_files/slide0004.htm.

16. *See, e.g.*, California *ex rel.* Lockyer v. Gen. Motors Corp., No. C06-05755 (N.D. Cal. Sept. 17, 2007), *available at* http://www.cand.uscourts.gov/cand/judges.nsf/61fffe74f99516d088256d480060b72d/61c396eab91-211868825735900798cf7/$FILE/5755orderdism.pdf (dismissing plaintiff's public nuisance claim for damages against automobile manufacturers which generate huge volumes of greenhouse gas emissions and allegedly contribute to global warming); Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265 (S.D.N.Y. 2005) (dismissing public nuisance suits filed by the states of Connecticut, New York, California, Iowa, New Jersey, Rhode Island, Vermont, and Wisconsin, as well as the City of New York and non-profit land trusts against electric utility companies seeking that the companies abate their emission of greenhouse gases because of the gases' contribution to global warming).

sance suits brought by a variety of states, most notably Connecticut and California, plaintiffs have alleged the existence of specific classes of responsible parties. To date, these cases have been dismissed in federal court in deference to past and future federal legislative processes which offer little or no promise of designating responsible parties. This is unfortunate. If allowed to proceed, the fact-finding process these suits would require could inform decision making at every level of government. The current gestational process regarding our national response to the climate crisis needs to incorporate the states' responsible party analysis into the policymaking process.

I. WHAT'S A LAWYER TO DO?

I have wondered about my role in fashioning a response to the approaching climate crisis. The literature I dutifully read seems unevenly divided between: (1) statements of the need for radical global reductions of greenhouse gas emissions based on dire predictions generated by fantastically complex computer models;[17] (2) assessments of mind-bendingly advanced technologies which may (or may not) be part of a solution but which always require twenty minutes (and a diagram) to explain;[18] and (3) economic analyses proving beyond any doubt that all the wonderful technologies may not be cost effective but that solving the problem is.[19]

My role as a citizen is fairly straightforward. As a matter of personal choice, I do what Al Gore tells me to do: Endeavor to reduce my personal carbon footprint and vote for candidates who are willing to admit the problem exists and willing to do something about it.

Someday there will be rules—a very complex set of rules by all indications. We lawyers will be able to battle over their meaning and application ("Mr. Brown invested $50,000 in carbon credits under the assumption that. . . ."). Right now, however, in the essential gestational phase of what promises to be one of the most significant social-legal regulatory structures in at least a generation, what are we good for?

17. *See, e.g.*, NICHOLAS STERN, STERN REVIEW ON THE ECONOMICS OF CLIMATE CHANGE, *available at* http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm (last visited Mar. 26, 2008); UK METEOROLOGICAL OFFICE, HADLEY CENTRE CLIMATE MODELS, *available at* http://www.metoffice.gov.uk/research/hadleycentre/models/modeltypes.html (last visited Mar. 26, 2008) [hereinafter OFFICE]; INT'L INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, REPORTS, *available at* http://www.ipcc-wg2.org [hereinafter PANEL].

18. *See, e.g.*, Alan Carlin, *Global Climate Change Control: Is There a Better Strategy than Reducing Greenhouse Gas Emissions?*, 155 U. PA. L. REV. 1401, 1401 (2007) (proposing that the optimum means of addressing climate change problems is to decrease radiation by "adding particles optimized for this purpose to the stratosphere to scatter a small portion of the incoming sunlight back into space" and also to reduce acidification in the ocean).

19. *See, e.g.*, STERN, *supra* note 17.

What do most of us know about liquefied carbon dioxide,[20] oceanic acidification,[21] or global dimming?[22]

My question is—of course—rhetorical. It is rhetorical both in the sense that I think I already have an answer and rhetorical in the sense that it sets up the point I am trying to make. I think we have a lot to add at this stage, and I think we have not been doing our job.

II. THINKING LIKE A LAWYER (ABOUT CLIMATE CHANGE)

Before I can explain the role we lawyers should play, there is a necessary preliminary step: a reorientation. Rather than applying legal analysis to scientific or political formulations about the climate crisis, I think we can (and must) reformulate the problem in traditional legal terms. This I will now—modestly—attempt to do.

First, if the scientists are right, climate instability poses the greatest threat to the global ecosystem, human liberty, private property, and "distinct investment-backed expectations"[23] over the next few centuries.

In 2007, the United States Fish and Wildlife Service (FWS), in response to a petition from the Center for Biological Diversity, published a proposed rule to list the Polar Bear as a threatened species under the Endangered Species Act.[24] It did this not because the species was being hunted, or because humans were occupying more of its habitat, but because of "the [potential] decrease of sea ice coverage."[25] The proposed rule explained that:

> Although some [polar bear] females use snow dens on land for birthing cubs, polar bears are almost completely dependent upon sea ice for their sustenance. Any significant changes in the abundance, distribution, or existence of sea ice will have effects on the number and behavior of these animals and their prey.[26]

Although well buried in the proposed rule, FWS admits:

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20. *See* David G. Hawkins, Daniel A. Lashof & Robert H. Williams, *What to Do About Coal*, SCI. AM., Sept. 2006, at 68-75 (discussing geologic carbon sequestration during coal processing).

21. *See generally* GERMAN ADVISORY ON GLOBAL CHANGE (WBGU), THE FUTURE OCEANS—WARMING UP, RISING HIGH, TURNING SOUR, SPECIAL REPORT (2006), *available at* http://www.wbgu.de/wbgu_sn2006_en.pdf; THE ROYAL SOCIETY OF THE UNITED KINGDOM, OCEAN ACIDIFICATION DUE TO INCREASED ATMOSPHERIC CARBON DIOXIDE, Policy Doc. 12/05 (June 2005), *available at* http://www.royalsoc.ac.uk/displaypagedoc.asp?id=13539.

22. *See* Gerald Stanhill & Shebtai Cohen, *Global Dimming: A Review of the Evidence for a Widespread and Significant Reduction in Global Radiation with Discussion of Its Probable Causes and Possible Agricultural Consequences*, AGRIC. & FOREST METEOROLOGY, Apr. 2001, at 255 (discussing the possible causes, effects, and need for future research regarding the reduced levels of solar radiation that are reaching the surface of the earth).

23. Penn-Central Transp. Co. v. City of New York, 438 U.S. 104, 124 (1978).

24. U.S. Fish & Wildlife Service—Alaska, Proposal to List the Polar Bear as Threatened Under the Endangered Species Act (Dec. 18, 2007), http://alaska.fws.gov/fisheries/mmm/polarbear/issues.htm#.

25. *Id.*

26. *Id.*

> Climate trends are not occurring evenly or in a linear fashion throughout the world; Arctic regions are being disproportionately affected by higher levels of warming. . . . Observations of Arctic changes, including diminishing sea ice, shrinking glaciers, thawing permafrost, and Arctic greening, validate earlier findings. . . .
>
> [P]revious projections regarding the rate and extent of climate change underestimated the temperature trend, reductions to annual sea ice during the summer and winter periods, reductions to multi-year pack ice, and reductions in thickness . . . indicated that the Arctic is moving toward a new "super interglacial" state that falls outside of natural glacial-interglacial periods that have characterized the past 800,000 years. . . . There is no paleoclimatic evidence for a seasonally ice-free Arctic during the past 800,000 years.[27]

As FWS makes clear, the costs of the climate crisis will not be evenly distributed. Scientists all over the world have documented the potential damage to ecosystems, not just in the Arctic but also in warmer climes. In April 2007, the United Nations' Intergovernmental Panel on Climate Change predicted "widening droughts in southern Europe and the Middle East, sub-Saharan Africa, the American Southwest and Mexico, and flooding that could imperil low-lying islands and the crowded river deltas of southern Asia."[28]

The damage will affect more than ecosystems. In their letter in *Nature* in 2005, prominent Indian scientists Sujatha Byravan and Sudhir Chella Rajan identified one of the "ironies" of climate change[29] as the probability that "although wealthy countries are responsible for most of the accumulated greenhouse gases in the atmosphere, they will . . . face less damage than poor countries."[30] Many of the areas of the globe that are projected to be most affected by the climate crisis are also home to the poorest human populations.

No lawyer who represents underprivileged human communities—in the Arctic, in the tropics or elsewhere—can imagine for a moment that his or her clients will be spared the brunt in the social reshuffling that "adaptation" to the climate crisis will require. Arguably, the climate crisis is already having an effect on the immigration debate in Europe and the United States, and the politics are not encouraging. Nicholas Stern's *The Economics of Climate Change: The Stern Review* estimates that by the middle of the twenty-first century, 150 to 200 million people

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27. Endangered and Threatened Wildlife and Plants, 72 Fed. Reg. 1064, 1071 (Jan. 9, 2007) (to be codified at 50 C.F.R. pt. 17), *available at* http://alaska.fws.gov/fisheries/mmm/polarbear/pdf/Polarbear_proposed_rule.pdf.

28. James Kanter & Andrew C. Revkin, *Scientists Detail Climate Changes, Poles to Tropics*, N. Y. TIMES, Apr. 7, 2007, at A1.

29. Sujatha Byravan & Sudhir Chella Rajan, *Immigration Could Ease Climate-Change Impact*, NATURE, Mar. 24, 2005, at 435.

30. *Id.*

may have become permanently displaced by climate change.[31] The prospect of the legal institutions we may create to control the 200 million refugees projected to result from unchecked climate instability chills the blood.

At the same time, the climate crisis will do what the Fifth Amendment to the United States Constitution forbids: It will "take" property, both by physical invasion (e.g., floods and mudslides) and by depriving owners of all reasonable use of their property. It will also take property without compensation. *The Stern Review* estimates that a continuation of "business as usual" will result in an average reduction in global per capita consumption of a minimum of 5.5 percent by 2200.[32] According to *The Stern Review*, adding the reduction of measurable per capita consumption to the estimated costs of direct impacts on human health and the environment ("non-market" impacts) increases that cost to 13.8 percent of per capita consumption.[33] Adding these estimates to the projected costs of amplifying feedback loops and the disproportionate share of the burden falling on developing countries less well positioned to adapt leads *The Stern Review* to estimate a 24.4 percent reduction in current per capita consumption,[34] "now and forever." Whether a five percent or a 24 percent reduction, the projected multi-trillion dollar reductions in global consumption estimated in *The Stern Review* signify something like the collapse of civilization. A lot of things just will not be worth what they used to be. A lot of property will not be worth anything at all.

Addressing the problem immediately and effectively does not make issues of cost and responsibility evaporate. If the *Stern* economists are right, addressing the problem (and thereby protecting, to the degree possible, those rights we hold dear) will also be expensive. *The Stern Review* indicates that aggressively addressing climate change will be cost effective—averting between a five percent and 24 percent loss in global consumption—at the cost of only about one percent world Gross Domestic Product (GDP) annually.[35] A good bargain, surely. Still, one percent of the roughly 48 trillion dollar current annual global GDP[36] is a little under 500 billion dollars a year. That is roughly what the war in Iraq has cost the United States so far.[37] Who should pay that cost?

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31. STERN, *supra* note 17, at 77.
32. *Id.* at 144.
33. *Id.* at 155-56.
34. *Id.* at 144.
35. *Id.* at 249.
36. WORLD BANK, TOTAL GDP 2006 4 (2007), http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf.
37. NATIONAL PRIORITIES PROJECT, THE WAR IN IRAQ COSTS, http://www.nationalpriorities.org/costofwar_home (last visited Mar. 26, 2008).

The costs of the climate crisis—be they the costs of climate instability or the costs of averting climate instability and most probably both—will initially be borne by a variety of people who, through no fault of their own, find their islands underwater,[38] their farms too parched to yield a crop,[39] their city neighborhoods repeatedly battered by hurricanes,[40] their prime Florida condominium development sites turned into wetlands,[41] or their planned coal fired power plants delayed or stopped.[42] Should these victims of the human-caused climate crisis be forced to bear these catastrophes without compensation? If they are entitled to compensation, from whom should they seek it?

As Professor Farber puts it:

> In a country whose political process is only now awakening to the reality of the climate change issue, it may seem almost utopian to worry about compensation. Current litigation is likely to attract more attention to the issue, as will some current endorsements of the idea in international law. If the issue is not in the forefront today, it seems safe to predict that it will be soon.[43]

So the climate crisis is, after all, a constellation of very familiar kinds of legal problems. It is about avoiding harms, protecting rights and expectations, marshaling resources to fix a problem, and compensating those injured by the conduct of others. It is about justice. Lawyers, breathe a sigh of relief. We are back on solid ground.

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38. Tuiloma Neroni Slade, *The Making of International Law: The Role of Small Island States*, 17 TEMP. INT'L & COMP. L. J. 531, 531, 540 (2003) (discussing the vulnerability of small island nations to climate change, citing rising sea levels as the "most critical threat" from climate change and referencing Maldives President Gayoom's 1987 statement to the U.N. General Assembly that unless the international community takes steps to mitigate climate change, it would prove to be 'the death of [Maldives].'").

39. Richard A. Kerr, *Warming Indian Ocean Wringing Moisture from the Sahel*, SCIENCE, Oct. 10, 2003, at 210 (suggesting that severe drought in the Sahel may be the result of climate change increasing the temperature of the Indian Ocean).

40. P.J. Webster, G.J. Holland, J.A. Curry & H.R. Chang, *Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment*, SCIENCE, Sept. 16, 2005, at 1844 (noting a possible correlation between global climate change and increased hurricane characteristics in the North Atlantic region); Kevin Trenberth, *Uncertainty in Hurricanes and Global Warming*, SCIENCE, June 17, 2005, at 1753 (discussing factors contributing to an increase in hurricanes in the North Atlantic during the last decade).

41. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, WORKING GROUP III FOURTH ASSESSMENT REPORT 100 (2007), http://www.mnp.nl/ipcc/pages_media/FAR4docs/final_pdfs_ar4/Chapter01.pdf (projecting a rise in sea level due to climate change); Lester R. Brown, *Rising Sea Level Forcing Evacuation of Island Country*, EARTH POL'Y INST., Nov. 15, 2001, http://www.earth-policy.org/Updates/Update2_printable.htm (noting that the projected rise in sea level threatens Florida beachfront properties to the extent that such properties "are becoming uninsurable.").

42. John Hanna, John Milburn & Carl Manning, *Kansas Regulator Rejects New Power Plants*, CBS NEWS/ASSOCIATED PRESS, Oct. 19, 2007, http://www.cbsnews.com/stories/2007/10/19/tech/main3387356.shtml?source=search_story (discussing Kansas' "Secretary of Health and Environment" Ron Benby's decision to reject air permits for two new coal-fired power plants because of the plants' greenhouse gas emissions).

43. Daniel A. Farber, *Responses to Global Warming: The Law, Economics, and Science of Climate Change*, 155 U. PA. L. REV. 1605, 1608 (2007).

III. RESPONSIBILITY FOR THE CLIMATE CRISIS (IN THEORY)

From a traditional lawyer's point of view, one of the keys to answering the now familiarly formulated questions regarding our response to the climate crisis turns on the meaning of a single word—responsibility. Responsibility is a word at the heart of our legal tradition.

The climate crisis is not just bad weather—it is a human-caused thing[44] like a car accident, a polluted lake, or a bankrupt company. When we deal with human-caused crises—be it the Exxon Valdez oil spill or the Enron collapse—our first questions address: (1) who is going to pay the necessary response costs; (2) who has been injured; and (3) how and if we can redress those injuries. Sometimes, we agree that those costs should be borne by the injured themselves, and sometimes we determine that the injuries be redressed by society at large, but more often than not we identify responsible parties and get them to pay. Taken from another point of view, the question is: Who should we *designate* as responsible in order to avoid similar future harms and reset the "moral balance" through "corrective justice"? Generally, we make people we designate responsible pay damages. Even when we do not make them pay, or do not make them pay the full cost of compensation, we let them know their conduct is unacceptable, in order to discourage them and others like them from doing it in the future.

Responsibility does not necessarily mean fault. It just means responsibility. To illuminate slightly, let us consider four relevant types of responsibility. We can even diagram them in two sets—responsibility for past action and responsibility for future action as opposed to responsibility to pay and responsibility to do (or not do).

Responsibility to Act	**Action for the Past→** Responsibility to Act (or Refrain from Acting) to Remedy Existing Problems
	Action for the Future→ Responsibility to Act (or Refrain from Acting) to Prevent/Mitigate Future Problems

44. *See* PANEL, *supra* note 17; OFFICE, *supra* note 17; GABRIELE C. HEGERL ET AL., UNDERSTANDING AND ATTRIBUTING CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 663, 665-66 (David J. Karoly et al. eds., Cambridge Univ. Press 2007), *available at* http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Print_Ch09.pdf (providing a scientific examination of the likelihood that humans have induced climate change).

Responsibility to Pay	**Payment for the Past→** Responsibility to Pay to Remedy Existing Problems.
	Payment for the Future→ Responsibility to Pay to Prevent/Mitigate Future Problems

So, for example, in the "Action for the Past" box, we might place the Endangered Species Act take prohibition, which prevents anyone from engaging in an action that will injure members of a particular species of "fish or wildlife," not because each animal is inherently valuable but because past conduct has pushed that species to the brink of extinction.[45] Someday, according to the Fourth Circuit in *Gibbs v. Babbitt*, we may again be able to hunt red wolves, but we cannot hunt them now because there is only a handful left.[46] We are all, in theory, responsible to refrain from such conduct, but the burden falls disproportionately on farmers and ranchers who might want to kill red wolves to protect livestock. They are responsible in a way the rest of us are not.

In the "Action for the Future" box we can place classic off-street parking requirements.[47] Under the zoning codes of most American cities, if you undertake a land use, you are obligated to provide sufficient off-street parking to support it. Many of us who have strayed into the world of parking regulation have been amazed by the simplicity of off-street parking mandates. In many cities, they are little more than a blunt statement that the user of a piece of land is responsible for providing the off-street parking his or her activity requires.[48] Still, these generic statements of responsibility have resulted in the investment of tens of billions of dollars in parking lots and structures.[49]

In the "Payment for the Past" box, we can place CERCLA-type retroactive owner and operator responsibility—the obligation to pay money to clean up releases of hazardous substances that have already taken place. Absent a very narrow range of defenses, the Comprehensive Environmental Compensation, Response and Liability Act of 1980 (CERCLA)[50] renders all "owners and operators"[51] of lands contaminated

45. 16 U.S.C.A. § 1538(a) (West 2008).

46. *See* Gibbs v. Babbitt, 214 F.3d 483, 498 (4th Cir. 2000).

47. *See generally* DONALD C. SHOUP, THE HIGH COST OF FREE PARKING (APA Planners Press 2004).

48. *See, e.g.*, DENVER, COLO., DENVER ZONING CODE art. VI, § 59-582 (2008).

49. Keith Bawolek, *What Drives Parking Investments*, COM. INV. REAL EST., April 2004, *available at* http://www.ciremagazine.com/article.php?article_id=66 (noting that the parking industry gets over 20 billion dollars in parking revenues each year).

50. 42 U.S.C.A. § 9607(b) (West 2002) (providing statutory defenses that preclude CERCLA liability).

with "hazardous substances" responsible for the costs of clean up.[52] Famously, CERCLA liability is not based on knowledge of wrongdoing or the illegality of any act at the time it was committed. Liability is limited to "response costs."[53]

In the "Payment for the Future" box we can place local "development impact fees"—the obligation to pay money to mitigate conditions that will result from a development as yet un-built.[54] When developers pay development fees in order to receive approval for a development from a local land use authority, what they pay is supposed to approximate the burden their development will impose on the jurisdiction granting approval and receiving the fee.

These categories are imperfect, but I think you will find them handy because, if you keep them in mind, you will discover that many current proposed responses to the climate crisis avoid holding anyone responsible for the problem in any of these four ways.

According to the synthesis report of the International Panel on Climate Change (IPCC) in 2007, there are now measurable changes in the world climate. The damage caused by the climate crisis is both in the past and in the future. In the scientific/bureaucratic jargon of the IPCC: "Of the 29,000 observational data series, from 75 studies that show significant change in many biological systems, more than 89 percent are consistent with the direction of change expected as a response to warming."[55] These changes can be traced to emissions of greenhouse gases (most significantly carbon dioxide) dating back to the beginning of the industrial revolution.[56]

The climate crisis has deep roots. However, greenhouse gas emissions are not like slavery and child labor (in the developed world): We cannot simply blame them on the dead. Annual emissions of greenhouse gases increased 70 percent between 1970 and 2004.[57] There are entities—major greenhouse gas emitters—around right now that we can hold

51. 42 U.S.C.A. § 9601(20)(A) (West 2002) (defining "'owner or operator'" for the purposes of CERCLA).

52. 42 U.S.C.A. § 9607 (West 2008).

53. Kenneth P. Dobson, *Methods and Motives for Imposing Strict Liability on Parties Hiring Independent Contractors to Transport Hazardous Materials in the State of Florida*, 24 VT. L. REV. 1297, 1301 (2000) (explaining that "CERCLA's strict liability covers only 'response costs,'" holding former and current facility owners or operators liable for releasing hazardous substances into the environment); Kurt M. Brauer, Acushnet Company v. Coaters, Inc.: *Defining the Role of Causation for CERCLA Response Cost Liability*, 44 WAYNE L. REV. 1465, 1466 (1998) (explaining that CERCLA is a "strict liability" statute that allows parties to recover response costs for "releases, or threatened releases, of hazardous substances").

54. *See* DEVELOPMENT IMPACT FEES IN THE ROCKY MOUNTAIN REGION (J. Bart Johnson & James van Hemert eds., The Rocky Mountain Land Use Inst. 2006).

55. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 2 (Nov. 2007) [hereinafter IPCC].

56. *Id.* at 5.

57. *Id.*

responsible for a significant portion of the current stock of greenhouse gases. Using our "Payment for the Past" CERCLA responsibility model, we could make them pay to mitigate past emissions. Using our "Action for the Past" Endangered Species Act responsibility model we can make them modify their conduct to avoid making existing problems worse.

The greenhouse gas emissions problem is projected to get much worse. The IPCC Special Report on Emission Scenarios (2000) projects an increase of greenhouse gas emissions of between 25 and 90 percent between 2000 and 2030.[58] There are entities around today that we can hold responsible for those projected emissions. Using our "Payment for the Future" development fees responsibility model, we can make them pay money to mitigate the impact of their future emissions. Using our "Action for the Future" off-street parking responsibility model we can make them do things to reduce and offset their future emissions.

But should anyone be held responsible for the climate crisis? After all, are we not all responsible? In the past few hours I have vented both carbon dioxide and methane. Have my emissions been offset by my office plants? While we all may be nominally responsible, some actors in society are far more responsible than others. Imposing legal responsibility on them is far, far easier, morally and politically.

Even if justice does not interest us, the designation of responsible parties is still necessary to fashion effective remedial mechanisms. A simple hypothetical should illustrate this point.

In 2004, the United States Environmental Protection Agency (EPA) released a national greenhouse gas inventory. Carbon dioxide constituted 84.6 percent of greenhouse gases emitted in the United States.[59] The inventory lumps the vast majority of United States carbon dioxide emissions (almost 95 percent) in one category, fossil fuel combustion.[60] The inventory then divides fossil fuel combustion by sector. Transportation and electrical generation are by far the two largest sectors, with industry coming in a distant third.[61] The bulk of greenhouse gas emissions in a developed country like the United States come from energy generation and transportation. While these sectors play a smaller role in the global inventory,[62] they are still significant.

Now imagine it were otherwise. Imagine that the primary source of greenhouse gases in the United States was meat eating. In fact, meat

58. *Id.* at 7.
59. U.S. DEP'T OF STATE, CLIMATE ACTION REPORT 2006 21 (2007).
60. *Id.* at 22.
61. *Id.* at 25.
62. For 2004, the IPCC divides the sources of anthropogenic greenhouse gas emissions globally into sections: Energy Supply (25.9 percent), Industry (19.4 percent), Forestry (including deforestation) (17.4 percent), Agriculture (13.5 percent), Transport (13.1 percent), Residential and Commercial Buildings (7.9 percent), and Waste (2.8 percent). IPCC, *supra* note 55.

eating is a source when you consider the indirect costs of raising, slaughtering, and transporting cattle, and transporting and refrigerating meat. In 2007, Britain's prestigious medical journal *The Lancet* reported that a reduction in global meat consumption would slow climate change.[63] This hypothetical is not far fetched. Still, it is a hypothetical.

If the primary cause of climate change were carnivory, would we approach the problem in the same way? Would a "cap and trade" system seem as appealing? Might a tax seem more attractive? How about an outright ban? I cannot tell you what your response to carnivory-caused climate change would be, but I am confident that it would be different than your response to climate change caused by vehicles and electric utilities.

What causes climate change, who is doing it, and what they can do about it must be near the foundation of any effective system to identify mechanisms to spread that cost equitably among those responsible parties, and identify measures to reduce those costs to the degree possible.

Who should be held responsible for greenhouse gas emissions from transportation and energy generation? Following the tenets of our environmental law tradition, the answer is energy generators and vehicle manufacturers. In 1970, in the Clean Air Act, we, as a nation, decided that air pollution was not everyone's responsibility, but rather the responsibility of major emitters of relevant air pollutants; they would be subjected to the now dreaded "command and control" requirements of that pioneering effort of environmental legislation. At the same time and in the same law, we decided that the manufacturers of motor vehicles should be held responsible for the emissions from the vehicles they manufactured and subjected to "command and control" standards.[64] Traditional air pollution is a "flow problem":[65] unlike greenhouse gases, traditional air pollutants do not accumulate over long periods of time so it does not matter what you emitted last week—just what you emit today.[66] As a result, the Clean Air Act subjected these two classes of parties to a form of responsibility akin to the "Action for the Future" off-street parking requirement—box two in our handy chart. They were not required to pay anything, directly. They were required to modify their

63. Maria Cheng, *Eating Less Meat May Slow Climate Change*, ENVTL. NEWS NETWORK, Sept. 13, 2007, http://www.enn.com/pollution/article/23011.

64. RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 70-71 (Univ. of Chicago Press 2004) (discussing the implications of the Clean Air Act for the automotive industry).

65. SCHLUMBERGER EXCELLENCE IN EDUCATIONAL DEVELOPMENT, GLOBAL CLIMATE CHANGE AND ENERGY: STOCK AND FLOW, http://www.seed.slb.com/en/scictr/watch/climate_change/stock.htm (last visited March 26, 2008).

66. ARNOLD W. REITZE JR., AIR POLLUTION CONTROL LAW: COMPLIANCE & ENFORCEMENT 411 (Envtl. Law Inst. 2001) (noting that greenhouse gases are unlike many other pollutants because efficient combustion does not prevent greenhouse gas formation); *see also id.* at 12-39 (providing a legal history of the Clean Air Act).

manufacturing processes to reduce emissions both from the processes themselves and from the products they manufactured.

These choices turned out to be wise. Air pollution regulation in the United States has been effective. According to EPA's 2003 "Draft Report on the Environment," between 1970 and 2001, while the United States Gross Domestic Product *increased* 161 percent, emissions of the six regulated "criteria" air pollutants (lead, particulates, nitrous oxides, sulfur dioxide, ozone, and carbon monoxide) *decreased* 25 percent.[67]

The choices have also been cost effective. Section 812 of the Clean Air Act Amendments of 1990 requires EPA to periodically assess the effect of the Clean Air Act on the "public health, economy and environment of the United States."[68] In 1997, EPA generated its first such report: *The Benefits and Costs of the Clean Air Act, 1970 to 1990.* The Report found the total monetized benefits of the Clean Air Act during that 20 year period to be between 5.6 and 49.4 trillion dollars with a central estimate of 22.2 trillion dollars.[69] The report found the total direct compliance expenditures (imposed on responsible parties) to be 0.5 trillion dollars.[70] In 1999, EPA prepared a second report entitled *The Benefits and Costs of the Clean Air Act, 1990 to 2010.* This new report estimated a cost-benefit ratio of one to four.[71]

Rendering this limited group of entities responsible has encouraged innovation, limited economic dislocation, and offended few people's moral sensibilities. It has not, however, made those designated responsible parties happy.

IV. AVOIDING DESIGNATING RESPONSIBLE PARTIES FOR THE CLIMATE CRISIS (IN PRACTICE)

When it comes to legislating about the climate crisis, our federal elected officials (overwhelmingly lawyers) appear to leave their traditional legal thinking at home and act more like the bit part players in a disaster movie.

According to Professor Victor Flatt, as of October 17, 2007, there were at least ten legislative proposals in Congress to address climate

67. ENVTL. PROT. AGENCY, DRAFT REPORT ON THE ENVIRONMENT 2003, at ii, 1-3 (2003), *available at* http://www.epa.gov/indicate/roe/html/roePDF.htm.

68. Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2691 (1990) (codified at 42 U.S.C. § 7612 (2006)).

69. ENVTL. PROT. AGENCY, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT, 1970 TO 1990, at ES-8 (1997), *available at* http://www.epa.gov/air/sect812/1970-1990/812exec2.pdf.

70. *Id.*

71. ENVTL. PROT. AGENCY, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT, 1990 TO 2010, at iii (1999), *available at* http://www.epa.gov/air/sect812/1990-2010/chap1130.pdf.

change—all proposed "cap and trade" approaches.[72] I will mention only a few representative examples.

The most prominent piece of proposed climate change legislation currently before Congress is Senator Joseph Lieberman and Senator John Warner's "America's Climate Security Act of 2007" (S. 2191)—approved by the Senate Environmental and Public Works Committee on December 5, 2007. The bill, characterized on Senator Lieberman's website as creating "an economy-wide cap and trade program that provides maximum flexibility for the marketplace to meet a level of emission reductions that is environmentally credible,"[73] goes to some lengths to avoid designating anyone responsible for greenhouse gas emissions.

While the bill's Section 2 "findings" declare that "prompt, decisive action is critical" and that "it is possible and desirable to cap greenhouse gas emissions," it never actually states that greenhouse gas emissions are the cause of climate change.[74] The closest the bill comes to acknowledging this causal connection is in its Section 3 "Purposes," in which it declares that the purpose of the Act is to "establish the core of a Federal program that will reduce United States greenhouse gas emissions substantially enough between 2007 and 2050 to avert the catastrophic impacts of global climate change."[75]

The bulk of the 214 page bill describes a mind-numbingly complex allowance trading system whereby greenhouse gas emitters trade "emission allowances" under slowly lowering emission allowance caps. In a "cap and trade" system, the primary opportunity for identifying any group of emitters as actually responsible for the projected climate catastrophe is in the allocation of emission allowances. If emitters were required to pay—prospectively and proportionally—for the right to push us all closer to the brink of catastrophic climate instability, then we would, at least, have a form of responsibility akin to "Payment for the Future" or development impact fees.

A responsibility analysis would suggest that the cost of emission allowances is dictated by the cost of eliminating or adapting to the consequences of those emissions. In fact, the Lieberman-Warner bill offers no link between the costs of emission allowances and the cost of responding to the consequences of those emissions. This absence of connection between the regulatory burden and the prospective costs of climate change is the primary missing link in the responsibility designation.

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72. Victor B. Flatt, *Taking the Legislative Temperature: Which Federal Climate Change Legislative Proposal Is "Best"?*, 102 NW. U. L. REV. COLLOQUY 123, 123, 135 (2007), *available at* http://colloquy.law.northwestern.edu/main/2007/12/taking-the-legi.html.

73. Website of Senator Joe Lieberman of Conn., Climate Change, http://lieberman.senate.gov/issues/globalwarming.cfm (last visited March 26, 2008).

74. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2(2), (4) (2007).

75. *Id.* § 3(1).

The primary identification of who is affected by the legislation appears in the bill's definition of "covered facility," which includes large fossil fuel fired electric generating units, large industrial carbon dioxide emitters, major producers and importers of coal or petroleum-based transportation fuel, and producers and importers of chemicals that emit large quantities of greenhouse gases.[76] This seems a promising list. It includes most of the major sources of greenhouse gases in the United States.

Section 1202 of the bill bears the promising title: "Compliance Obligation."[77] The section requires the owner or operator of a "covered facility" to submit to EPA emission allowances, or a variety of other rough equivalents, to cover greenhouse gas emissions for the previous year.[78] But how do "covered facilities" get these emission allowances? The bill grants 12 percent of "emission allowances" free of charge to covered facilities on the basis of past emissions (rewarding past bad conduct) and allocates the rest (by shifting formula) to states, Indian tribes, and a newly created Climate Change Credit Corporation to auction off.[79]

Referring back to our handy chart, the Lieberman-Warner cap and trade system does not require potentially responsible parties (admirably identified in the definition of "covered facilities") to *do* anything to remedy past or prevent/mitigate future problems. They can continue to emit greenhouse gases. Eventually, the bill would require that they *pay* something for the right to emit. But the connection between that payment and any remedy for an existing problem or solution to a future problem is tenuous. While not a complete subsidy for emitters, the structure—through its complexity if nothing else—avoids making a significant designation of responsibility.

Representative Henry Waxman's bill, H.R. 1590, the "Safe Climate Act of 2007," introduced on March 20, 2007, is more forthright and one tenth as long. Waxman's findings state that "decisive action is needed to minimize the many dangers posed by global warming" and that "with only 5 percent of the world population, the United States emits approximately 20 percent of the world's total greenhouse gas emissions and must be a leader in addressing global warming."[80] Waxman's bill specifically requires that emission "allowances" be issued through auctions in most cases.[81] Still, Waxman's bill is largely bereft of language indicating responsibility for climate change or the causal link between cli-

76. *Id.* § 4(7).
77. *Id.* § 1202.
78. *Id.* § 1202(a).
79. *Id.* § 3301; *see* Website of Senator Joe Lieberman of Conn., S. 2191 Emission Allowance Allocation Table, http://lieberman.senate.gov/documents/acsaemission.pdf (last visited March 26, 2008).
80. Safe Climate Act of 2007, H.R. 1590, 110th Cong. § 2(a)(7) (2007).
81. *Id.* § 704(a), (d)(1)(A).

mate change and greenhouse gas emissions. Again, there is no explicit relationship between the costs of emission allowances and the projected costs of responding to the consequences of those emissions.

Another approach to responsibility appears in Senator Diane Feinstein's "Electric Utility Cap and Trade Act of 2007" (S. 317). Senator Feinstein's bill deals explicitly with the electric utility industry, defining an "affected unit" as "an electric generating facility."[82] The bill regulates emissions from that group of potentially responsible parties alone. Ambiguity arises from the fact that it is not clear what others groups of responsible parties would be subject to similar treatment. As Professor Victor Flatt puts it:

> The difficulty with cap-and-trade enforcement may be why two of the proposals (Feinstein-Carper and Alexander-Lieberman) only apply to the electricity sector. It has already been demonstrated that this sector can be efficiently regulated in a cap-and-trade system. However, limiting the law to this one sector means that overall emissions reductions cannot be as large. Moreover, it raises fairness concerns. . . . [These proposals] could be seen as compromise proposals that anticipate further legislation in other sectors. . . .[83]

The process in the international sphere is also remarkably free of meaningful responsible party designations. While the responsibility of developed world nations for the projected climate crisis affects every aspect of the negotiations, the negotiated documents do not address responsibility directly.

The 1992 Framework Convention on Climate Change designates 36 Annex I nations deemed "developed" and subject to more obligations in responding to climate change.[84] The nature of those obligations, however, is diffuse and the basis for the obligations is largely unstated. To the degree that the document deals with the basis of the developed world's obligation, it implies something more akin to *noblesse oblige* than responsibility:

> Each of these [Annex I] Parties shall adopt national . . . policies and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs. These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse

82. Elec. Util. Cap and Trade Act of 2007, S. 317, 110th Cong. § 701(1) (2007).

83. Flatt, *supra* note 72, at 137-38 (2007) (footnotes omitted).

84. UNITED NATIONS, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE 6-7, 23 (1992), *available at* http://unfccc.int/not_assigned/b/items/1417.php.

> gases not controlled by the Montreal Protocol would contribute to such modification, and taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective.[85]

The much discussed 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change is also based on an implicit, but unstated, notion of responsibility. Forty-one Annex I nations, developed countries in Europe and North America with the exception of Australia, Japan, New Zealand, bind themselves to meet specific greenhouse gas emissions targets.[86] The other nations of the world have no specific emission limitation obligations. The imposition of specific obligations on only 41 countries has been justified in terms of their historic responsibility for the currently high levels of greenhouse gases in the atmosphere, and also on the fact they contain the lion's share of the world's technological economy and therefore emit the lion's share of the world's greenhouse gases. China and India's exclusion from the Annex I nations, in the absence of any statement about responsibility—prospective or retrospective—has provided the United States with an excuse to avoid ratifying the Kyoto Protocol.[87]

The documents adopted as part of the "Bali Roadmap" and "Action Plan" after the United Nations Climate Change Conference in Bali in December 2007, seem, if possible, a retreat from the idea of designating responsible parties.

Perhaps the strongest statement of "differentiated responsibilities" appears in *United Nations Framework Convention on Climate Change: The First Ten Years*:

> The Convention laid down the foundation for these policies by both developing and developed countries, recognizing their common but differentiated responsibilities and respective capabilities. Although the most immediate responsibility for cutting greenhouse gas emissions lies with the richer and more industrialized countries, the developing countries too need to establish climate-friendly patterns of

85. *Id.* at 6.

86. *See* UNITED NATIONS, KYOTO PROTOCOL TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE 3, 20 (1998), *available at* http://unfccc.int/resource/docs/convkp/kpeng.pdf.

87. David Sanger, *Bush Will Continue to Oppose Kyoto Pact on Global Warming*, N.Y. TIMES, June 12, 2001, at A1 ("Mr. Bush remained firm in rejecting the 1997 Kyoto accord, noting that it set no standards for major emitters of greenhouse gases, like China and India, while creating mandates for the United States that could prove economically crippling.").

sustainable development for which they should also be able to rely on bilateral and multilateral assistance.[88]

V. THE STATES (IN LITIGATION) IDENTIFY RESPONSIBLE PARTIES

The title of this article alludes to the interrelationship between jurisdictions in responding to climate change. You may wonder, so far, what this analysis has to do with the relationship among jurisdictions. The answer, of course, is that while federal legislative solutions and international processes have shied away from designating responsible parties for climate change, litigation pursued by states has endeavored to designate responsible parties and, to date, has failed.

In July 2004, the States of Connecticut, New York, California, Iowa, New Jersey, Rhode Island, Vermont, and Wisconsin, and the City of New York, filed suit against American Electric Power Company, American Electric Power Service Corporation, the Southern Company, the Tennessee Valley Authority, XCEL Energy and CINERGY alleging claims of public nuisance under both federal and state law.[89] The complaint did not hesitate to designate responsible parties and set forth the bases of their responsibility. The complaint alleged damages already suffered and to be suffered in the foreseeable future:

> Global warming already has begun to alter the climate of the United States. The threatened injuries to the plaintiffs and their citizens and residents from continued global warming include increased heat deaths due to intensified and prolonged heat waves; increased ground-level smog with concomitant increases in respiratory problems like asthma; beach erosion, inundation of coastal land, and salinization of water supplies from accelerated sea level rise; reduction of the mountain snow pack in California that provides a critical source of water for the State; lowered Great Lakes water levels, which impairs commercial shipping, recreational harbors and marinas, and hydropower generation; more droughts and floods, resulting in property damage and hazard to human safety; and widespread loss of species and biodiversity, including the disappearance of hardwood forests from the northern United States.[90]

The complaint then alleged who was responsible:

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88. UNITED NATIONS, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE: THE FIRST TEN YEARS 43 (2004), *available at* http://unfccc.int/resource/docs/publications/first_ten_years_en.pdf.

89. Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 267-68 (S.D.N.Y. 2005); *see also* Andrew C. Revkin, *New York City and 8 States Plan to Sue Power Plants*, N.Y. TIMES, June 12, 2004, at A5. A copy of the original complaint filed in the district court, Complaint, Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 267-68 (S.D.N.Y. 2005), is available at http://www.oag.state.ny.us/press/2004/jul/jul21a_04_attach.pdf.

90. Complaint, *Am. Elec.*, 406 F. Supp. 2d at 1-2.

> Defendants, by their annual emissions of approximately 650 million tons of carbon dioxide, are substantial contributors to elevated levels of carbon dioxide and global warming. Defendants are the five largest emitters of carbon dioxide in the United States and are among the largest in the world. Defendants' emissions constitute approximately one quarter of the U.S. electric power sector's carbon dioxide emissions and approximately ten percent of all carbon dioxide emissions from human activities in the United States.[91]

Finally, the complaint alleged how the responsible parties could mitigate or eliminate the problem through their actions:

> Defendants have available to them practical, feasible and economically viable options for reducing carbon dioxide emissions without significantly increasing the cost of electricity to their customers. These options include changing fuels, improving efficiency, increasing generation from zero- or low-carbon energy sources such as wind, solar, and gasified coal with emissions capture, co-firing wood or other biomass in coal plants, employing demandside management techniques, altering the dispatch order of their plants, and other measures.[92]

The complaint deftly sketches out the basis for legal responsibility: the gravity of the threat, the injuries that can reasonably be expected to result from it, the significance of the defendants' contribution to the threat, and the defendants' capacity to mitigate if not eliminate the threat. Lawyers were at work.

At the end of more than 50 pages of allegations, plaintiffs requested an order to hold the defendants "jointly and severally liable for creating, contributing to, and/or maintaining a public nuisance; [p]ermanently enjoining each defendant to abate its contribution to the nuisance by requiring it to cap its carbon dioxide emissions and then reduce them by a specified percentage each year for at least a decade" and, of course, "such other relief as this Court deems just and proper."[93] In essence, the states requested that: (1) defendants be held liable for their past and future conduct, roughly the equivalent of "Payment for the Past" CERCLA-type liability for past emissions and "Payment for the Future" development fees for future emissions; and (2) that defendants be ordered to refrain from some future conduct reasonably anticipated to make the problem worse, roughly the equivalent of the "Action for the Past" Endangered Species Act take prohibition. In other words, they demanded that the court hold the defendants responsible.

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91. *Id.* at 1.
92. *Id.* at 2.
93. *Id.* at 49.

On September 20, 2006, the State of California filed suit against General Motors, Toyota Motors North America, Ford Motor Company, Honda North America, Chrysler Motors, and Nissan North America in another public nuisance case.[94] Again, the plaintiff clearly alleged the basis for liability. While setting forth in detail the actual and potential damage to California's snowpack and coastline, the complaint alleged: "Defendants, by their annual emissions in the United States of approximately 289 million metric tons of carbon dioxide are substantial contributors—among the world's largest contributors—to global warming and to the adverse impacts on California."[95]

The complaint also alleged that "[d]amages caused by global warming are cognizable, ongoing and increasing. Defendants are aware of the impacts and have chosen to continue to produce products that generate enormous quantities of carbon dioxide, to the detriment of California."[96]

Again, the elements of the argument for legal responsibility are clear: the gravity of the threat, the injuries that can reasonably be expected to result from it, the significance of the defendants' contribution to the threat, and the defendants' capacity to mitigate, if not eliminate, the threat.

In a significant departure from the Connecticut model, California requested only that the court "[h]old each defendant jointly and severally liable for creating, contributing to and maintaining a public nuisance" and for "monetary damages according to proof."[97] California's allegations limit responsibility to an obligation to pay, both for past and future injury.

The strong statements of alleged responsibility embodied in these two complaints were filed in federal district courts—in the Southern District of New York and Northern District of California. Had the litigation been allowed to proceed, the courts would have developed a factual record to support (or contradict) the state's allegations. Both complaints, however, were dismissed.

In September 2005, the United States District Court for the Southern District of New York dismissed the Connecticut complaint on "political question" grounds in deference to the very modest legislative action taken by the federal government to combat climate change at that time.[98] The court emphasized the need to leave the question to the "ac-

94. California v. Gen. Motors Corp., No. C06-05755 MJJ, 2007 WL 2726871 (N.D. Cal. Sept. 17, 2007) (order granting defendants' motion to dismiss).

95. Complaint at ¶ 3, California v. General Motors Corp., 2006 WL 2726547 (Sept. 20, 2006) (No. 06-05755 MJJ).

96. *Id.*

97. *Id.*

98. *See* Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 274 (S.D.N.Y. 2005).

countable" political branches of government.[99] "Because resolution of the issues presented here requires identification and balancing of economic, environmental, foreign policy, and national security interests," the court found that "a policy determination" was required.[100] The court largely ignored the fact that plaintiffs represented the "political branches" in eight states and the nation's largest city and that—in the absence of federal action—those political entities had few other mechanisms to discharge their political obligations to their constituents. More significantly for our purposes, the court dismissed state claims offering a theory of responsibility in favor of a barely identifiable federal policy offering none.

The district court ruling in *Connecticut v. American Electric Power* is currently on appeal to the United States Court of Appeals for the Second Circuit.[101] In September 2007, the United States District Court for the Northern District of California dismissed California's complaint on similar grounds. The court dismissed on political question grounds, again deferring to the limited legislation already enacted by Congress.[102] The court went further, indicating that the United States Supreme Court's grant of standing to state plaintiffs in *Massachusetts v. EPA*[103] somehow required dismissal of state plaintiffs' claims in *California v. General Motors Corp.*[104]

Quoting the majority opinion in *Massachusetts*, the court argued that the fact that "Massachusetts cannot invade Rhode Island to force reductions in greenhouse gas emissions" somehow deprives Massachusetts or California of the right to sue General Motors in federal court.[105] The court argued that the Clean Air Act precluded California's suit: "Underpinning the Supreme Court's standing analysis is the concept that the authority to regulate carbon dioxide lies with the federal government, and more specifically with the EPA as set forth in the [Clean Air Act]."[106] The court avoided traditional preemption analysis to deprive the State of its common law rights for the simple reason that the Clean Air Act contains two broad "savings clauses" preserving state common law jurisdiction[107] for all parties including, arguably, the United States,[108]

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99. *Id.* at 267.
100. *Id.* at 274.
101. *See* Brief of Amici Curiae, U.S. Senator James M. Inhofe and the Washington Legal Foundation in Support of Defendants-Appellees and Supporting Affirmance of the District Court, Connecticut v. American Elec. Power Co., 406 F. Supp. 2d 265 (S.D.N.Y. 2005) (No. 05-5104), *available at* http://www.wlf.org/upload/Connecticut%20%20v.%20American%20Electric%20-Power%20Compa ny,%20Inc.pdf.
102. *General Motors Corp.*, 2007 WL 2726871, at *8-10, *16.
103. 127 S. Ct. 1438 (2007).
104. *General Motors Corp.*, 2007 WL 2726871, at *10-13.
105. *Id.* at *11.
106. *Id.*
107. 42 U.S.C.A. §§ 7416, 7604(e) (West 2008).
108. United States v. Atlantic-Richfield Co., 478 F. Supp. 1215, 1220 (D. Mont. 1979).

but almost certainly the states. In a remarkably creative justification for dismissing a common law nuisance claim, the court declared:

> Because the States have "surrendered" to the federal government their right to engage in certain forms of regulations and therefore may have standing in certain circumstances to challenge those regulations, and because new automobile carbon dioxide emissions are such a regulation expressly left to the federal government, a resolution of this case would thrust this Court beyond the bounds of justiciability.[109]

The district court ruling in *California v. General Motors Corp.* is also on appeal to the United States Court of Appeals for the Ninth Circuit.[110]

Both the Connecticut and California courts rely on the third prong in the traditional six-part *Baker v. Carr*[111] political question justiciability test articulated by the United States Supreme Court in 1962: "the impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion."[112] As the California court put it: "This factor largely controls the analysis in the current case due to the complexity of the initial global warming policy determinations that must be made by the elected branches prior to the proper adjudication of Plaintiff's federal common law nuisance claim."[113] As the Connecticut court put it: "In this case, balancing those interests, together with the other interests involved, is impossible without an 'initial policy determination' first having been made by the elected branches to which our system commits such policy decisions, viz., Congress and the President."[114]

It is not entirely clear what "balancing of economic, environmental, foreign policy, and national security interests" the courts would demand from federal elected officials before they would be comfortable considering the existence and scope of defendants' responsibility for the damages associated with climate change. What is clear is that they do not want to be the first to determine who should be held responsible for the climate crisis.

CONCLUSION

We could characterize the contrast between the federal legislative proposals, based on emission trading and avoiding the designation of responsible parties, and the state complaints in litigation, designating

109. *General Motors Corp.*, 2007 WL 2726871, at *12.

110. *See* Appellant's Opening Brief, California v. General Motors Corp., 2007 WL 27226871 (9th Cir. 2008) (No. 07-16908), *available at* http://ag.ca.gov/globalwarming/pdf/ninth_circuit_brief.pdf.

111. 369 U.S. 186 (1962).

112. *Id.* at 217.

113. *General Motors Corp.*, 2007 WL 2726871, at *6.

114. Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 272 (S.D.N.Y. 2005).

responsible parties, as either a conflict or a frustrated symbiotic relationship. My natural optimism favors the second possibility. We need not follow the example of the district court opinions in *Connecticut v. American Electric Power* and *California v. General Motors Corp.* and emphasize the potential conflicts between the litigation process initiated in the state public nuisance cases and the legislative process going on in Congress. Instead, we can emphasize how these two very different legal processes might support each other. If the states, or other plaintiffs, are ever able to sustain cases like the Connecticut and California public nuisance cases in court, they will develop factual records regarding the responsibility of the named defendants for the climate crisis. By doing so, they could help us do the one thing both national legislative and international quasi-legislative processes seem incapable of doing: they could help us identify responsible parties.

If we are fortunate, the next stage in this gestational process toward a regulatory scheme to deal with the climate crisis will involve both focusing on classes of responsible parties and identifying workable mechanisms for dividing the costs of response to climate change among them. For now, we can only hope.

A COOPERATIVE FEDERALISM PROPOSAL FOR CLIMATE CHANGE LEGISLATION: THE VALUE OF STATE AUTONOMY IN A FEDERAL SYSTEM

ALICE KASWAN†

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INTRODUCTION

There is little doubt that climate change is an urgent problem, requiring urgent attention at all levels of government. Climate change policies are likely to require pervasive technological, economic, and behavioral changes at every level of society, with potentially profound implications. Policymakers will have to determine not only how much to reduce, but how the reductions are to be achieved and with what consequences for whom. Who will make these critical decisions?

Policymakers and scholars alike are struggling with the federalism question: whether climate change regulation should flow from a global, national, state, or local level. In this article, I provide theoretical and practical justifications for a cooperative federalist approach that strives to avoid the weaknesses and build on the strengths of each level of government. I then provide specific proposals for federal legislation that are designed to garner the advantages of federal regulation while respecting the states' autonomy to set more stringent standards and tailor critical implementation decisions to state-specific conditions.

Part I establishes the fundamental importance of federal legislation. Collective action and leakage concerns will undoubtedly necessitate overarching global and national approaches. Moreover, given mismatches in the costs and benefits of climate change regulation experienced by individual states, under-regulation by the states is likely. Federal legislation would also offer greater economies of scale and consistency than state-level approaches.

Notwithstanding the importance of federal legislation, Part II addresses the states' critical role within a federal structure in light of the pervasive local impacts of climate change, the significant political, economic, and environmental implications of alternative regulatory approaches, and the local nature of many potential climate change strategies. Moreover, a federal monopoly on regulatory authority could create institutional inertia and would fail to provide a check on interest group capture.

After reviewing the theoretical justifications for allowing a state role, Part II turns to a case study on the environmental justice provisions in California's climate change legislation that illuminates several key state interests. California's innovative climate legislation not only estab-

lishes ambitious greenhouse gas reduction goals, it also requires that those goals be achieved in ways that protect and enhance air quality in polluted communities. If national legislation creates federal goals and implementation structures that explicitly preempt such state initiatives, or if the courts interpret future federal statutes to implicitly preempt state laws, then the states will have lost the power to control the impacts of climate change regulation. More broadly, the nation will have lost the "laboratories" of innovation that the states could otherwise have provided.

Part III evaluates existing cooperative federalism models. It notes that the most significant federal legislation proposed to date, the Warner-Lieberman bill, provides only a limited role for the states. Other climate change and domestic environmental law programs provide greater insights on model cooperative federalist structures. In the climate change context, I consider the relatively decentralized approaches taken by the Regional Greenhouse Gas Initiative and the European Union's Emissions Trading System. On the domestic front, I consider the Clean Air Act, which gives the federal government the authority to establish minimum goals but gives states the discretion to adopt stricter environmental goals and shape implementation to respond to state-specific political and economic needs. While these models have not operated with full success, they suggest options worthy of further consideration.

Part IV provides a preliminary sketch of a cooperative federalist structure for federal climate change legislation and analyzes the specific benefits of shared federal and state responsibilities. It argues that the federal government should set minimum goals and standards, but that, in most cases, it should not preempt state efforts to set more stringent goals or standards. It then turns to program implementation, and argues that, in light of the key environmental, political, and economic implications of cap-and-trade programs, states should be allowed (but not required) to administer such programs subject to minimum federal standards. State autonomy over critical decisions is worth some potential loss in consistency and efficiency.

In addition, I suggest that state implementation planning, similar to that employed under the Clean Air Act, would facilitate the achievement of both federal and state goals. Federal emission reductions goals could be allocated to the states, and state implementation plans could then be required to show how each state will integrate federal minimum requirements and adopt its own initiatives to achieve its required reductions. Federal goals will not be achievable without state-directed actions, like land use and transportation controls. Moreover, the states' unique circumstances and preferences are likely to prompt differing strategies for reaching climate change goals. State implementation plans could provide a critical mechanism for demonstrating how federal and state measures will be combined to achieve the nation's overall objectives.

I. THE IMPORTANCE OF FEDERAL LEGISLATION

In the absence of U.S. participation in the Kyoto Protocol and the absence of a comprehensive federal regulatory approach,[1] the states have taken the lead in adopting significant climate change initiatives.[2] California's Global Warming Solutions Act[3] and the northeastern states' Regional Greenhouse Gas Initiative,[4] as well as several other less specific or developed state and regional programs, have been critical.[5] However, initiatives to date are unlikely to reduce emissions sufficiently to address the threat of climate change.[6] Furthermore, given the global nature of climate change, future state initiatives are unlikely to provide a sufficient response.

In determining the appropriate jurisdictional level for regulation, scholars frequently refer to the "matching principle": that the jurisdictional level should match the scale of the environmental problem in question.[7] Local environmental problems should be resolved at a local level, problems that cross state lines should be resolved nationally, and, presumably, problems that cross national boundaries, like climate change, should be resolved internationally.[8] Matching the jurisdiction to the problem means that the jurisdiction can fully account for the net costs and benefits of regulation. Otherwise, perverse results would ensue.

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1. *See* Alice Kaswan, *The Domestic Response to Global Climate Change: What Role for Federal, State, and Litigation Initiatives?*, 42 U.S.F.L. REV. 39, 42-45 (2007) (describing weak federal initiatives).

2. *See* Randall S. Abate, *Kyoto or Not: Here We Come: The Promise and Perils of the Piecemeal Approach to Climate Change Regulation in the United States*, 15 CORNELL J.L. & PUB. POL'Y 369, 372 (2006) (describing a wide range of state programs); J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1521-30 (2007) (same); Kirsten Engel, *State and Local Climate Change Initiatives: What is Motivating State and Local Governments to Address a Global Problem and What Does This Say About Federalism and Environmental Law?*, 38 URB. LAW. 1015, 1016-29 (2006) (same); Robert B. McKinstry, Jr. & Thomas D. Peterson, *The Implications of the New "Old" Federalism in Climate-Change Legislation: How to Function in a Global Marketplace when States Take the Lead*, 20 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 61, 76-84 (2007) (listing state programs).

3. CAL. HEALTH & SAFETY CODE §§ 38500-99 (West 2007).

4. *See* REGIONAL GREENHOUSE GAS INITIATIVE, MEMORANDUM OF UNDERSTANDING (Dec. 20, 2005), *available at* http://www.rggi.org/docs/mou_final_12_20_05.pdf [hereinafter MEMORANDUM].

5. *See* Abate, *supra* note 2, at 372; DeShazo & Freeman, *supra* note 2, at 1521-30; Engel *supra* note 2, at 1016-29 (listing sources that describe state programs). The Pew Center for Global Climate Change provides up-to-date information on state programs. *See* Pew Center on Global Climate Change, *What's Being Done . . . in the States*, http://www.pewclimate.org/what_s_being_done/in_the_states/ (last visited Mar. 27, 2008).

6. *See* Kirsten H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 ECOLOGY L.Q. 183, 220-23 (2005); Jonathon B. Wiener, *Think Globally, Act Globally: The Limits of Local Climate Policies*, 155 U. PA. L. REV. 1961, 1966-67 (2007).

7. *See* Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Federal Authority*, 14 YALE. L. & POL'Y REV. 23, 25 (1996); *see, e.g.*, Engel & Saleska, *supra* note 6, at 191-92 (describing "matching principle").

8. *See* Wiener, *supra* note 6, at 1964.

For example, in the context of global climate change, states may be unwilling to regulate sufficiently because the costs of regulation—all internal—could exceed the benefits—benefits necessarily shared with the rest of the globe.[9] Leaving action solely to the states also creates the risk of free riders, who hope to benefit from other states' regulation but are unwilling to assume the costs themselves.[10] States acting alone consistently fear "leakage": that state regulation to control greenhouse gas emissions will drive economic activity to unregulated states, merely relocating rather than reducing emissions.[11] If the emissions simply shift location, then the regulating state would not have achieved its reduction goal and could, in the meantime, have suffered adverse economic consequences from its regulation. Leakage concerns are thus likely to chill state action. A related concern is the race to the bottom, in which states forego or weaken desired environmental regulation because they fear it could drive away business.[12]

In addition, in the climate change context, different states perceive different internal cost/benefit alignments. Some states might perceive significant benefits from controlling greenhouse gases and not experience significant costs from its regulation.[13] California, for example, is

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9. *See* DeShazo & Freeman, *supra* note 2, at 1518; Barry G. Rabe, Mikael Roman & Arthur N. Dobelis, *State Competition as a Source Driving Climate Change Mitigation*, 14 N.Y.U. ENVTL. L.J. 1, 7 (2005); Wiener, *supra* note 6, at 1965. Similarly, Professor Engel notes that, where pollution crosses state boundaries, states will pollute too much because they can externalize the environmental costs while retaining economic benefits. *See* Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159, 164 (2006).

10. *See* Kaswan, *supra* note 1, at 72; Wiener, *supra* note 6, at 1965.

11. *See* DeShazo & Freeman, *supra* note 2, at 1532 (describing leakage risk in the context of state renewable energy requirements); Wiener, *supra* note 6, at 1967-73. Professor Wiener notes that leakage could take several forms. Under the "price effect," regulation could lead to higher prices, prices which would shift consumer demand to products made in states or countries lacking controls. *Id.* at 1967-68. The "slack off" effect is a form of the free rider problem: If states see other states taking aggressive measures, they might slack off their own efforts. *Id.* at 1968. The "capital relocation" effect could occur if industries respond to regulation by relocating to unregulated states or countries. *Id.* at 1968. Professor Wiener provides a thoughtful analysis of the factors that could influence the potential net emissions consequences of these forms of leakage. *Id.* at 1969-73.

12. *See* DeShazo & Freeman, *supra* note 2, at 1518-19; Wiener, *supra* note 6, at 1965. Academics have debated the validity of the race-to-the-bottom theory. *See* Kaswan, *supra* note 1, at 62 n.122. Professor Revesz has argued that states engage in competition for both businesses and citizens that allows them to choose the balance of environmental and economic amenities that best suits their preferences. *See* Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race-to-the-Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210, 1211 (1992). The dynamics of interstate competition in any given instance are complicated, but it is conceivable that, at least in some instances, the fear of losing business would deter a state from enacting desired environmental regulation. *See* Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is It "To the Bottom"?*, 48 HASTINGS L.J. 271, 303-04 (1997) (providing empirical data suggesting that states fear that their environmental regulations could deter economic investment).

In California, regulators confront the risk of economic flight as they develop their climate change regulations. Entities likely to be subject to the state's climate change regulation have stated that they will move their operations outside the state if the state's regulations are too onerous. *See* Matthew Yi, *Dems, Governor Spar over Road to Clean Air*, S.F. CHRON., July 17, 2007, at A1.

13. Kaswan, *supra* note 1, at 66-67.

deeply concerned about the impact of climate change on its coastline, its water supply system, and its air quality.[14] In addition, given its strong technology sector, California anticipates net economic benefits from climate change regulation as the state develops the innovative technology necessary to transition away from a carbon-intensive economy.[15] Moreover, California's control costs could be less than those of other states because it is not heavily dependent on coal, a significant source of greenhouse gases.[16] Other states might foresee fewer short-term benefits from controlling greenhouse gas emissions, but expect significant costs.[17] For example, a state that relies heavily on coal mining or burning is responsible for significant emissions, but would experience high costs of control and, at least in the short-term, might not find the benefits of regulation worth the costs.[18]

These disconnects between the causes and consequences of emissions, and the disconnects between the distribution of the costs and benefits of control, suggest that reliance on the states could lead to significant under-regulation.[19] In light of the United States' unwillingness to take a global approach by ratifying the Kyoto Protocol,[20] the next-best approach, under the matching principle, would be federal regulation. A federal approach would require all states to address the out-of-state con-

14. *See* CALIFORNIA CLIMATE CHANGE CENTER, OUR CHANGING CLIMATE: ASSESSING THE RISKS TO CALIFORNIA (2006), http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF.

15. *See* Kaswan, *supra* note 1, at 66 (describing California's expectation of economic benefits arising from its climate change legislation); Rabe, Roman & Dobelis, *supra* note 9, at 37-41 (describing states' interest in economic development opportunities associated with climate change regulation).

16. *See* CALIFORNIA ENERGY COMMISSION, INTEGRATED ENERGY POLICY REPORT 2007 (EXECUTIVE SUMMARY) 11 (2007) (indicating, in Figure 6, that only 8 percent of California's energy comes from coal), *available at* http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CMF-ES.PDF.

17. *See* McKinstry & Peterson, *supra* note 2, at 92 (observing that some states are likely to experience greater costs from climate change regulation than others).

18. *See* Rabe, Roman, & Dobelis, *supra* note 9, at 11 (observing that states with significant economic investments in carbon-producing industries are reluctant to address climate change); *cf.* Zachary Coile, *Energy Bill Draft Splits House Dems: It's Pelosi's Greens Against Industry Protectionists*, S.F. CHRON., June 8, 2007, at A7 (noting, in the context of support for federal legislation, that lawmakers from coastal states have favored deep emissions cuts while those "from states producing automobiles, coal and oil favor a go-slow approach."). States may also fail to act due to agency capture. Powerful interests within a state could influence state policy in a manner ultimately deemed inconsistent with that state's best interests. *See* Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 WAKE FOREST L. REV. 719, 734-35 (2006) (discussing potential for "capture" of state government).

19. This is not to say that the states do not have any motivation for taking action; the presence of so many significant state initiatives demonstrates that states have found sufficient political, economic, and environmental justifications for action. *See* Kirsten Engel, *State and Local Climate Change Initiatives: What Is Motivating State and Local Governments to Address a Global Problem and What Does This Say About Federalism and Environmental Law*, 38 URB. LAW. 1015, 1016-21 (2006); Kaswan, *supra* note 1, at 65-68. That said, however, the states' collective efforts are unlikely to be sufficient.

20. *See* Engel & Saleska, *supra* note 6, at 186.

sequences of their emissions and would reduce leakage among the states.[21]

Other arguments, in addition to the matching principle, support federal regulation. Rather than having each state explore the greenhouse-gas-reduction potential of each sector, it would be more efficient for the federal government to research technological and operational opportunities.[22] The federal government also has more resources at its disposal.[23] In addition, although I argue for allowing state flexibility, the existence of a federal approach is likely to reduce the multiplicity of approaches to greenhouse gas regulation around the country. To the extent that many states simply follow the federal approach, without adding state-specific implementation measures, the number of diverse approaches would be reduced in comparison with a purely state-based approach.[24] Finally, to the extent the federal government adopts a cap-and-trade program, a larger market could lower costs[25] and increase the fluidity of the market by creating more trading opportunities and smoothing out the consequences of local events.[26] The nation thus needs a federal approach to climate change.

II. THE STATE ROLE IN A FEDERAL PROGRAM

Notwithstanding the need for federal legislation, the states have a vital interest in establishing their own climate change goals and in asserting at least limited control over key implementation decisions. In this Part, I justify a cooperative federalist approach[27] that sets significant federal minimum standards and then provides states with considerable autonomy to exceed federal minimums and implement greenhouse gas

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21. A federal approach would not, however, address the risk of international leakage: the risk that federal domestic legislation could shift emissions to countries that are not regulating greenhouse gas emissions. *See* Wiener, *supra* note 6, at 1967-68 (describing leakage caused by single-country regulation in the absence of a global agreement).

22. *See generally* Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570, 614-15 (1996) (describing greater efficiency of federal regulation).

23. *Id.* at 585-86.

24. *See* McKinstry & Peterson, *supra* note 2, at 105 (suggesting that minimum federal standards would establish floors that would lead to more uniform standards than a purely state-based approach).

25. Lower costs are beneficial if they allow regulatory authorities to set higher emissions caps than they would if reductions were more expensive. *See* ENVTL. PROT. AGENCY, TOOLS OF THE TRADE: A GUIDE TO DESIGNING AND OPERATING A CAP-AND-TRADE PROGRAM FOR POLLUTION CONTROL (2003), http://www.epa.gov/airmarkets/resource/docs/tools.pdf. Lower costs could also alleviate the economic costs of addressing climate change. That said, however, lower costs are beneficial only to a point. If costs are too low, then regulated entities and the technology sector will not receive a sufficient price signal to invest in alternative emission-reducing technologies.

26. *See* Engel & Saleska, *supra* note 6, at 228.

27. Scholars have historically focused on dual federalism: the respective roles of the states *versus* the federal government. *See* Engel, *supra* note 9, at 163-66, 175. Recent scholarly attention has focused on the idea of cooperative federalism, which embodies shared powers and, at times, overlapping federal and state roles. *Id.* at 175-76 (noting scholarly literature on "dynamic federalism," "empowerment federalism," "polyphonic federalism," "interactive federalism," and "vertical regulatory competition").

reduction strategies. The appropriate balance between federal and state responsibility depends, of course, on the nature of the regulatory strategy, a subject I address in the context of specific proposals in Part IV, below.

After describing the theoretical justifications for creating a cooperative federalism approach, I use the environmental justice provisions in California's climate change legislation as a case study on the practical importance of allowing state implementation autonomy.

A. Theoretical Justifications for a Strong State Role

1. Arguments in Favor of State Autonomy

The "matching principle" provides important insights into why a regulatory jurisdiction should match the scale of the environmental problem, and why climate change requires a global and national solution.[28] But that is not the end of the story. Additional "matches" suggest the suitability of multiple levels of regulation.[29]

Environmental problems are not one-dimensional: Global problems like climate change have local manifestations that could shape the nature of a locality's desired response. Thus, as suggested above, a state like California, that perceives significant risks from climate change, could be willing to establish more stringent goals than the federal government.

Similarly, the consequences of climate change regulation are local. Climate policies that require local industries to reduce greenhouse gases will have local economic consequences, both positive and negative, that will depend upon the nature of the industry, the ease of making reductions, and the chosen regulatory mechanism for requiring reductions.[30] Local reductions will also have local environmental consequences: Reductions in greenhouse gases generally (although not necessarily) lead to reductions in harmful co-pollutants.[31] The rate and distribution of greenhouse gas reduction requirements could thus impact the local distribution of harmful co-pollutants. Due to the economic and environmental implications of regulatory strategies, states thus have an interest in the stringency of direct regulation as well as in the relative role of a cap-and-

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28. *See* William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547, 1604-06 (2007).

29. *See id.* at 1604-05, 1617 (critiquing the matching principle for its heavy focus on the location of pollution, and arguing that other factors, including the benefits and harms of regulation, should influence jurisdictional choice).

30. *See* McKinstry & Peterson, *supra* note 2, at 87-88 (observing that states can better devise climate change programs to address their particular regional characteristics and industries).

31. *See* MARKET ADVISORY COMMITTEE TO THE CALIFORNIA AIR RESOURCES BOARD, RECOMMENDATIONS FOR DESIGNING A GREENHOUSE GAS CAP AND TRADE SYSTEM FOR CALIFORNIA 13 (2007) (observing that production changes that reduce greenhouse gases tend to reduce co-pollutant emissions as well) [hereinafter MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD.].

trade program and its operational features. While the global scale of climate change requires an international and national response, the local implications of climate change policies provide a justification for allowing some state flexibility in determining how to implement national goals.

A state role within a federal system is further justified by familiar principles of democratic theory.[32] As Professor Kirsten Engel has stated, federal preemption "cuts short the lawmaking process and products of an entire level of democratic government."[33] If states wish to achieve more demanding goals, or to control the economic and environmental consequences of climate change policies, then allowing states the latitude to do so allows them to fulfill their citizens' preferences.[34]

Federal minimums which prevent states from setting lower goals or standards may appear, at first blush, to prevent some states from realizing their preference for lower standards.[35] But the federal minimum would allow other states to meet their democratic preferences, since race to the bottom and leakage concerns might have prevented some states from adopting their ideal standards.[36] One state's democratic loss is another's democratic gain. Moreover, the democratic argument has limits: A state's choice not to control its emissions is less compelling where that choice has adverse consequences for other states or, in this instance, for the globe.[37] Democratic theory thus supports having federal minimums, but allowing states to exceed them.

State initiatives may also be more amenable to "bottom-up" participation by affected constituencies.[38] Including stakeholders in policy development can provide policymakers with critical information that could lead to more tailored and effective programs and could, potentially, increase "stakeholder buy-in."[39] (However, since the states are as vul-

32. *See* Esty, *supra* note 22, at 609-10 (describing democratic theory in favor of decentralized decision making).

33. Engel, *supra* note 9, at 184.

34. *See* Esty, *supra* note 22, at 610 (stating democratic justification for state-level jurisdiction); Richard B. Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196, 1210 (1976-77) (same); *see also* DeShazo & Freeman, *supra* note 2, at 1519-20 (observing that state climate change initiatives have been a response to their citizens' fears about climate change); Engel, *supra* note 2, at 1025; Glicksman, *supra* note 18, at 779 (noting that recent state environmental initiatives have been a response to state citizen desires for environmental protection).

35. *See* Buzbee, *supra* note 28, at 1581, 1586.

36. *Id.* at 1580 (noting that federal minimums help states meet their preferences by dampening the race to the bottom).

37. *See* Butler & Macey, *supra* note 7, at 33 (observing that, in the case of interstate pollution spillovers, pure state regulation would lead to political failure since the victim state would have no capacity to control the polluting state's pollution); Stewart, *supra* note 35, at 1227 (stating that "a state should not be entitled to invoke the principle of local self-determination against federal controls where that state generates significant spillovers which impair the corresponding ability of sister states to determine the environmental quality they shall enjoy.").

38. *See* McKinstry & Peterson, *supra* note 2, at 73, 87.

39. *Id.*

nerable to political capture as the federal government, federal minimum standards remain essential.[40])

Another familiar argument in favor of retaining state flexibility is that allowing the states to adopt alternative approaches fosters technological and regulatory innovation.[41] The states can act as "laboratories for invention" by exceeding minimum federal product, production, or renewable portfolio standards, thereby promoting technological innovation that could provide models for other industries or jurisdictions.[42] Differing regulatory approaches, like direct regulation, variants on cap-and-trade programs, or new approaches to land use regulation, could likewise test and provide models for other jurisdictions. Allowing state experimentation is particularly appropriate where the problem to be addressed is new and where policymakers are uncertain about the best mechanisms for addressing it.[43] In the climate change context, Professor William Buzbee has stated that "[i]n settings of volatility and diversity of conditions, especially where knowledge is incomplete and evolving rapidly, room for pragmatic adjustment and experimentation is critical."[44] A cooperative federalist approach that establishes basic federal parameters but allows states to diverge could provide the best of all worlds; it takes advantage of the economies of scale of a federal approach, while allowing state experimentation.

Allowing a diversity of requirements and approaches also helps counteract potential defects in legislative and regulatory processes.[45] Federal preemption of divergent state approaches lodges complete power in a single federal decision-maker.[46] Once federal decision-makers act, they could fail to review and assess the standards or approaches they have adopted.[47] They could develop a significant institutional investment in the status quo.[48] Allowing states to develop more demanding or divergent standards and approaches would create a diversity of players simultaneously working to solve similar problems, stimulating continual interaction, challenge, debate, reexamination, and inquiry.[49] While that

40. *See* Glicksman, *supra* note 18, at 734-35 (discussing risk of agency capture at the state level).

41. *See* Engel, *supra* note 9, at 182-83.

42. Under the Clean Air Act, for example, California is allowed to adopt vehicle emission standards that differ from federal requirements, so long as EPA waives the normally-applicable federal preemption provision. *See* 42 U.S.C.A. § 7543(b) (West 2008). The differing requirements have prompted technological innovation. *See* Ann E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 DAVIS L. REV. 281, 313-18 (2003).

43. *See* Buzbee, *supra* note 28, at 1619; Engel, *supra* note 9, at 182.

44. Buzbee, *supra* note 28, at 1619.

45. *See id.* at 1597; Engel, *supra* note 9, at 178-81.

46. *See* Buzbee, *supra* note 28, at 1597.

47. *Id.* at 1594-95.

48. *Id.* at 1595, 1608-09.

49. *Id.* at 1588-89, 1597; Butler & Macey, *supra* note 7, at 53 (observing that centralized decision making impedes the detection of policymaking errors); Engel, *supra* note 9, at 170-73 (describing the dynamic innovation encouraged by the interplay of state and federal standard-

conflict may not always be comfortable, having a multiplicity of players is more likely to lead to continuing assessment and improvement in technological requirements and regulatory programs than a preemptive federal approach.

Having a multiplicity of players could also ameliorate the risk of agency capture, at both the federal and state levels.[50] If Congress or implementing agencies are heavily influenced by particular interest groups to the detriment of the public interest,[51] and the federal law preempts divergent state approaches, then there is no antidote for the political failure.[52] Without attempting to resolve the fine line between "capture" and the appropriate operation of the political process in balancing diverse needs, one could imagine that interests heavily invested in the short-term future of coal or the existing state of the automobile industry could influence legislative or regulatory processes in ways that (arguably) underregulate in light of the long-term risks posed by climate change and the general public interest. Given the risk of federal agency capture, the states could retain the authority to impose more demanding requirements.[53]

A state role may also be necessary to address issues that are better suited to state and local resolution than federal resolution. Without essentializing the nature of "federal" versus "state" activities, certain governmental decisions, like land use and building codes, have traditionally been under state control. This is not to say that the federal government should be precluded from addressing these areas. Even so, the federal government could be more successful at meeting national goals if it enlisted the states' assistance and cooperation in areas traditionally within their control.[54]

2. Concerns Raised by State Autonomy

In the context of regulatory standards and the operation of a cap-and-trade program, inconsistency is a significant consequence of allowing states to diverge from federal standards and giving them implementa-

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setting); *see also infra* notes 239 to 248 and accompanying text (describing the dynamic tension between state and federal appliance efficiency and vehicle emission standards).

50. *See* Buzbee, *supra* note 28, at 1594-95; Engel, *supra* note 9, at 161, 178-81.

51. *See* Buzbee, *supra* note 28, at 1590-91, 1609.

52. *See* Butler & Macey, *supra* note 7, at 53; Engel, *supra* note 9, at 163.

53. In theory, there is also the risk of agency capture by environmentalists, leading to overly restrictive regulation at the federal or state level. For example, if environmentalists captured the federal legislative process, then arguably states should be allowed to set standards below the federal level to provide an antidote to environmentalists' control at the federal level. In light of the relative power of the interest groups, and the diffuse nature of the public's concern about climate change in comparison to the intense interest of the regulated community, this risk appears less compelling than the risk of industry capture.

54. *See* John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183, 1218 (1995)

tion discretion.[55] Nationwide industries could encounter differing standards in different states, leading to inefficient production and management.[56] If states could impose their own requirements on a cap-and-trade program, the program's transactions costs would increase. From a participatory standpoint, industries and public interest groups would have to monitor and participate in proceedings around the country, rather than focusing their resources on federal legislative and regulatory process.[57]

Consistency is an important, but not necessarily determinative, factor. The virtues of consistency must be weighed against the benefits of a diversity of approaches. The significance of consistency is also dependent upon the type of regulation at issue.[58] For example, inconsistent product standards could adversely impact industrial efficiency.[59] In contrast, overarching environmental goals have relatively little impact on industrial efficiency, and do not present a compelling case for preemption.[60] Process and performance standards, permitting structures, and other regulatory options fall somewhere in between.[61] I discuss these issues in the climate change context more specifically below, in Part IV.

A cooperative federalist approach would also pose less risk of inconsistency than a pure reliance on state initiatives. A federal approach that gave states the option, but did not mandate, state divergence or implementation would likely limit the degree of diversity. Under existing cooperative federalist approaches, many states do not choose to deviate from the federal minimums.[62]

In addition to inconsistency, another potential risk of state action is that states could develop requirements that favor their own interests and jeopardize out-of-state interests. Climate change policy could thus become a protectionist vehicle.[63] State product standards pose this risk if

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55. *See* Buzbee, *supra* note 28, at 1600.

56. *See* Carlson, *supra* note 42, at 313-14; DeShazo & Freeman, *supra* note 2, at 1530-31.

57. *See* Engel, *supra* note 9, at 181 (noting that most interest groups would prefer federal policies so that they could avoid having to lobby in all 50 states); *cf.* Stewart, *supra* note 35, at 1213-15 (noting that, relative to industry, environmental groups are likely to have more power at the federal level, given their relative lack of resources).

58. *See* Buzbee, *supra* note 28, at 1603-04 (arguing that the nature of the regulatory target is a key factor in determining whether preemption—and its accompanying consistency—is appropriate).

59. *See id.* at 1603; Kaswan, *supra* note 1, at 82-83. Federal statutes addressing product standards are more likely to preempt state approaches than other federal regulatory statutes. *See* Buzbee, *supra* note 28, at 1561-64; Engel & Saleska, *supra* note 6, at 224-26.

60. Kaswan, *supra* note 1, at 82.

61. *See* Buzbee, *supra* note 28, at 1603-04; Kaswan *supra* note 1, at 81-83 (discussing the benefits and drawbacks to preemption for a number of types of regulatory efforts).

62. Some states have gone so far as to pass legislation preventing their states from exceeding federal standards. *See* Jerome M. Organ, *Limitations on State Agency Authority to Adopt Environmental Standards More Stringent than Federal Standards: Policy Considerations and Interpretive Problems*, 54 MD. L. REV. 1373, 1375-95 (1995).

63. In other words, states could engage in a form of "cost externalization" by imposing constraints on out-of-state interests for the benefit of in-state interests. *See* Butler & Macey, *supra* note 7, at 45-47 (describing cost externalization risk of state-level regulatory action). More broadly, this theory suggests that states imposing external costs might fail to comprehensively analyze the costs

they are designed to favor in-state industries and are not otherwise environmentally justified.[64] On the other hand, states may be unable to prevent leakage and meet their goals without establishing policies that have some impact on out-of-state interests. For example, California has enacted an environmental performance standard for electricity that essentially prevents the state from using electricity generated by traditional coal-fired power plants,[65] a standard that will have little impact within the state, due to its lack of coal-fired power, but that is likely to reduce certain electricity imports.[66] Without the ability to impose the standard on electricity imports, California's greenhouse reduction goals could be undermined by utilities' switching from California energy sources that must meet the standard to out-of-state sources that are not subject to it. So long as they are environmentally justified, states should be allowed to develop product or production criteria to meet their objectives, even if such measures have an incidental impact on out-of-state industries. Moreover, such restrictions often impose higher costs on in-state residents, thus providing a check on the risk of protectionist and self-serving legislation.[67] In such interstate conflicts, there is no obvious reason why the regulating state's interests should cede to the impacted state's interests.

Climate change is unquestionably a global problem, and strong federal minimums are necessary. But the states have a vital interest in the consequences of climate change and a major stake in the economic and environmental consequences of climate change regulation itself. The states could foster innovation and avoid the risk of federal complacency and inertia. Allowing states to exceed federal minimums could also provide a structural antidote to potential agency capture at the federal level. As Professor Kirsten Engel has stated, "[p]reemption . . . is the real boogeyman of public interest lawmaking because it prevents the political process from policing itself."[68]

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and benefits of regulation. Using the example of a non-coal state imposing restrictions on the use of coal, the theory posits that states might impose restrictions that provide them with environmental benefits but whose costs they do not have to endure. *See id.* at 45, n.45 (quoting E. Donald Elliott et al., *Toward a Theory of Statutory Evolution: The Federalization of Environmental Law*, 1 J.L. ECON. & ORG. 313, 329 (1985)). As Butler and Macey go on to note, however, the restricting state's consumers generally experience higher costs from the regulation, even if its industries are not directly affected. *See* Butler & Macey, *supra* note 7, at 47. In many situations, costs are not, in fact, "externalized" in a manner that would lead to political failure. *Id.*

64. Butler & Macey, *supra* note 7, at 45-48.

65. *See* Patricia Weisselberg, *Shaping the Energy Future in the American West: Can California Curb Greenhouse Gas Emissions from Out-of-State, Coal-Fired Power Plants Without Violating the Dormant Commerce Clause?*, 42 U.S.F. L. REV. 185 (2007).

66. *See id.* at 213 (describing utility argument that the burden of the California standard will fall heavily on out-of-state coal-fired power plants).

67. *See* Butler & Macey, *supra* note 7, at 47.

68. Engel, *supra* note 9, at 163.

B. *A Case Study on the Value of State Autonomy: California's Environmental Justice Provisions*

1. Introduction

The environmental justice provisions in California's climate change legislation help illuminate the value of retaining state autonomy within a federal system. While the case study does not raise all of the relevant issues, it reveals: (1) the local political, environmental, and economic implications of climate change regulation; (2) the expression of uniquely state-level political preferences that are unlikely to be manifested in federal legislation; and (3) critical state interests that could arise in the operation of a cap-and-trade program, the type of program that many assume operates best at a national if not an international scale. The environmental justice case study highlights the states' strong interest in shaping regulatory processes to meet state-specific goals and needs.

In 2006, California enacted one of the nation's first comprehensive climate change statutes,[69] the Global Warming Solutions Act, commonly referred to as AB 32.[70] The statute requires the state to reduce its greenhouse gas emissions to 1990 levels by 2020.[71] Although it provides relatively little detail about how to achieve the required reductions, the law explicitly includes parameters to achieve environmental justice, regardless of the specific regulatory programs the state chooses to adopt.[72]

The environmental justice implications of potential implementation strategies were a key issue in legislative deliberations. The Governor strongly supported a cap-and-trade program while many legislators, concerned about the environmental justice implications of market-based systems, were opposed.[73] As a consequence, the law permits but does not require the creation of a market mechanism.[74] In addition, the law requires the state's regulations to serve environmental justice through provisions designed to enhance participation in the development of implementing regulations, substantive environmental protections for polluted areas, and provisions designed to direct economic opportunities to disadvantaged communities.

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69. Several northeastern states preceded California. *See* Abate, *supra* note 2, at 377-81. But California's size and influence gave California's legislation greater national and international significance.

70. CAL. HEALTH & SAFETY CODE §§ 38500-99 (West 2007).

71. *Id.* § 38550.

72. *See infra* notes 75 to 111 and accompanying text.

73. *See* Mark Martin, *Nunez Slams Governor on Emission Law*, S.F. CHRON., Oct. 17, 2006, at B1 (describing legislature's rejection of the Governor's proposal to mandate a cap-and-trade program).

74. CAL. HEALTH & SAFETY CODE § 38570(a).

2. Participatory Environmental Justice Provisions

Citizens' participation in decisions affecting their communities is a central value in the environmental justice movement.[75] Participation is necessary (though not sufficient) to empower disadvantaged communities in decision making processes that have historically failed to serve their interests. Participation also helps government agencies obtain first-hand information about conditions in the communities their decisions will affect.[76]

AB 32 explicitly encourages broad participation in the development of its implementing regulations and participation by disadvantaged communities in particular.[77] The law requires the California Air Resources Board (CARB), the agency with primary implementation authority, to consult a wide range of stakeholders in developing its regulations, including "the environmental justice community, industry sectors, business groups, academic institutions, [and] environmental organizations."[78] It requires the creation of an Environmental Justice Advisory Committee (EJAC) whose members are to be drawn from the state's most polluted areas, "including, but not limited to, communities with minority populations or low-income populations."[79] In addition, as it develops its regulatory scoping plan, the law requires CARB to hold public workshops in regions of the state suffering from poor air quality, once again including, but not limited to, minority and low-income communities.[80]

3. Substantive Environmental Justice Provisions

Substantively, distributive justice is a key goal of the environmental justice movement.[81] The movement seeks to redress the current inequity in the distribution of pollution and its effects.[82] Numerous studies have documented substantial disparities in the distribution of polluting facilities, which are more likely to be concentrated in of-color and low-income communities.[83] In California, many areas of the state have failed to at-

75. *See* Alice Kaswan, *Distributive Justice and the Environment*, 81 N.C. L. REV. 1031, 1045-47 (2003) (describing claims in terms of "political justice").

76. *See* Stephen M. Johnson, *Economics v. Equity: Do Market-Based Environmental Reforms Exacerbate Environmental Injustice?*, 56 WASH. & LEE L. REV. 111, 159 (1999).

77. By "disadvantaged," I am referring to disadvantages such as disproportionate exposure to undesirable land uses, to poverty, and to a lack of political power, conditions that are often correlated with race and income.

78. CAL. HEALTH & SAFETY CODE § 38501(f) (West 2007).

79. CAL. HEALTH & SAFETY CODE § 38591(a) (West 2007). The Environmental Justice Advisory Committee has been constituted and includes representatives from a range of environmental justice organizations around the state. *See* Cal. Evtl. Prot. Agency Air Res. Bd., Global Warming Environmental Justice Committee, http://www.arb.ca.gov/cc/ejac/ejac.htm (last visited Mar. 27, 2008) (committee website, listing members).

80. CAL. HEALTH & SAFETY CODE § 38561(g) (West 2007).

81. *See* Kaswan, *supra* note 75, at 1043-44.

82. *Id.* at 1037-39 (summarizing theories of distributive justice).

83. *Id.* at 1069-77.

tain the nation's ambient air quality standards (NAAQS) and attainment remains a far-off goal.[84]

Although carbon dioxide does not cause local environmental consequences,[85] climate change regulation nonetheless implicates local pollution because the chief source of greenhouse gas emissions, combustion, generates not only carbon dioxide, but a host of problematic co-pollutants.[86] These co-pollutants can include nitrogen oxides, sulphur oxides, particulates, mercury, volatile organic compounds, and, in some cases, an array of other hazardous air pollutants. While not directly correlated, policies to reduce greenhouse gas emissions are likely to have the co-benefit of reducing co-pollutants.[87] Similarly, policies that allow greenhouse gas emissions to remain the same will not generate co-pollutant reduction benefits, and policies that allow greenhouse gas emissions to increase in local areas (presumably offset by decreases elsewhere) could cause at least some degree of local increases in co-pollutants.

In the ensuing subsections, I first consider provisions addressing co-pollutant emissions, including provisions that are designed to prevent increases in pollution and provisions that are designed to ensure that the state reaps environmental and economic co-benefits from climate change regulation. Next, I briefly consider how such provisions could affect the development of climate change regulations. Finally, I consider the provision designed to channel potential economic opportunities arising from climate change regulation to disadvantaged communities and its policy implications.

(a) Provisions Implicating Co-Pollutant Emissions

i. Provisions that Prevent Increases in Co-Pollutants

AB 32 states generally that CARB must "[e]nsure that the activities undertaken to comply with [its] regulations do not disproportionately impact low-income communities."[88] The statement is broad, and could include both economic and environmental impacts. From an environmental standpoint, it suggests that measures that could create "hot spots" by increasing air pollutants in already-burdened areas would violate this provision. For example, if the state's emerging low-carbon fuel standard

84. Maps indicating the California regions that are in and out of attainment for particular criteria pollutants are available on the following website: ENVTL. PROT. AGENCY, REGION 9, AIR QUALITY MAPS, (Mar. 7, 2008), http://www.epa.gov/region09/air/maps/maps_top.html.

85. *See* A. DENNY ELLERMAN ET AL., EMISSIONS TRADING IN THE U.S.: EXPERIENCE, LESSONS, AND CONSIDERATIONS FOR GREENHOUSE GASES 40-41 (2003), *available at* http://www.pewclimate.org/global-warming-in-depth/all_reports/emissions_trading/.

86. *See* Alice Kaswan, *Environmental Justice and Domestic Climate Change Policy*, ENVTL. L. REP. NEWS & ANALYSIS 10287, 10298 (forthcoming May 2008).

87. *See* MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD., *supra* note 31 and accompanying text.

88. CAL. HEALTH & SAFETY CODE § 38562(b)(2) (West 2007).

led to a net increase in problematic co-pollutants from mobile sources that would most impact residents in low-income areas,[89] the law could require the state to impose additional vehicle emission controls.[90]

The greatest controversy has concerned the potential adoption of a cap-and-trade program for greenhouse gas emissions.[91] A cap-and-trade program could have significant distributional consequences, since some facilities might reduce on behalf of others, who might not reduce at all or could, subject to existing limits discussed below, increase their greenhouse gas emissions through purchasing allowances. If allowances are auctioned, some facilities would purchase less than existing emissions, some would maintain emissions, and some could potentially purchase enough allowances to increase emissions (subject to existing limits).

AB 32 addresses the risk of hot spots. The law specifically states that CARB must consider potential "direct, indirect, and cumulative emission impacts . . . including localized impacts in communities that are already adversely impacted by air pollution" before adopting a market mechanism.[92] CARB must not only evaluate such impacts; it must design market mechanisms "to prevent any increase in the emissions of toxic air contaminants or criteria pollutants."[93]

That raises the key question: Would a greenhouse gas trading program lead to localized increases in co-pollutant emissions, notwithstanding aggregate reductions? The answer is complicated. For the most part, a greenhouse gas trading program would not be the legal *cause* of co-pollutant increases. Co-pollutants are subject to existing regulatory programs and a carbon trading program would not, presumably, displace existing regulations. However, existing regulatory programs generally allow emissions to increase up to a certain point.[94] Most facilities are not bound by absolute caps on their emissions; instead, they are subject to

89. The public health consequences of renewable fuels, and ethanol in particular, are contested. A recent study suggests that, notwithstanding some environmental benefits, high ethanol use could lead to a net increase in respiratory illnesses and deaths in certain regions due to synergistic effects between ethanol-related emissions and existing pollutants. *See* Mark Z. Jacobson, *Effects of Ethanol (E85) Versus Gasoline Vehicles on Cancer and Mortality in the United States*, 41 ENVIRON. SCI. & TECH'Y 4150 (2007). Switching from gasoline to diesel, due to diesel's lower carbon content, could also create environmental concerns due to the health risks associated with diesel's high particulate emissions. *See* CAL. AIR RES. BD., FACT SHEET: HEALTH EFFECTS OF DIESEL EXHAUST PARTICULATE MATTER 4-5 (2006), http://www.arb.ca.gov/research/diesel/dpm_draft_3-01-06.pdf.

90. If additional vehicle emission controls are needed to address pollutants created by ethanol, California would once again have to assert its unique authority under the Clean Air Act to adopt mobile source standards that diverge from federal standards, and would once again have to request an EPA waiver of the Clean Air Act's customary preemption provision. 42 U.S.C.A. § 7543(b) (West 2008).

91. Under a cap-and-trade program, a cap on total emissions for the regulated sector would be set and pollution allowances would be distributed, for free or by auction, to regulated facilities. In a traditional cap-and-trade program, facilities that reduced emissions could trade excess allowances to facilities that did not receive enough allowances to cover their emissions.

92. CAL. HEALTH & SAFETY CODE § 38570(b)(1) (West 2007).

93. *Id.* § 38570(b)(2).

94. *See* Kaswan, *supra* note 86, at 10299-301.

emission rate limitations.[95] As long as the permissible rate of emissions does not exceed their permit limits, they can increase the absolute quantity of their co-pollutant emissions.[96] Actual amounts of co-pollutants could increase up until the increase is deemed a "significant increase" that triggers the Clean Air Act's rigorous pollution control requirements for modified sources ("new source review" or NSR).[97] Increases could be locally problematic even if they did not trigger NSR.[98] In addition, if absolute increases in emissions are caused by an increase in hours of operation or production, and not by a physical change to a facility, then NSR would not be triggered notwithstanding a facility's significant increase in emissions.[99] Thus, a cap-and-trade program would not preclude emissions increases that are already permissible under the existing regulatory system.

In a narrow set of circumstances, a cap-and-trade system could be a more direct cause of emissions increases.[100] It is conceivable that a large company with multiple facilities would make production decisions based, in part, on the costs of greenhouse gas controls. It might choose to lower production at facilities with lower costs of control. It might then use the freed-up allowances to increase production, up to the constraints imposed by existing co-pollutant permits, at facilities facing higher costs of control. In this situation, the carbon trading system would have directly motivated, not simply facilitated, increased co-pollutant emis-

95. Under the Clean Air Act, the new source-related standards, like the New Source Performance Standards, Lowest Achievable Emission Rate standard for new sources in nonattainment areas, and Best Available Control Technology Standards for new sources in attainment areas, are all presumptively emission rate standards. *Id.* at 10300 n.131. Hazardous air pollutants standards are also presumptively emission rate standards. *Id.* The standards are often framed in terms of emissions per unit of production, pollutant concentrations per unit of emissions, or a rate of pollution over time. *Id.* at 10300 n.132. Where smaller facilities seek to avoid being designated as "major" sources subject to stringent pollution control regulation, however, they sometimes accept an absolute cap on emissions so that their emissions will not exceed the "major" threshold. *Id.* at 10300 n.129.

96. *See id.* at 10299-300.

97. *See, e.g.*, DAVID WOOLEY & ELIZABETH MORSS, CLEAN AIR HANDBOOK § 1:111 (2007) (providing general description of NSR program for modified facilities).

98. The threshold for triggering NSR requirements differs by pollutant and by an air district's degree of nonattainment. *See id.* § 1:113 (indicating threshold for criteria pollutants). Thresholds from 15 to 40 tons per year are common. *See id.* Increases of this magnitude could, depending upon local circumstances and the number of facilities engaging in increases, create local concerns. Moreover, the increases can be more dramatic than the rule suggests. In determining the baseline from which to measure an emissions increase, facilities can choose the average emissions during any two year period within the preceding ten years, even if recent emissions were considerably lower. *See* 40 C.F.R. § 52.21(b)(48)(ii)(c) (2008). As a practical matter, facilities could therefore increase their emissions considerably more than the threshold amount if their recent emissions have been lower than they were during the preceding ten years.

99. NSR applies only to "modifications" to existing facilities that result in a significant increase. *See, e.g.*, 42 U.S.C.A. § 7501(4) (West 2008) (defining modification for facilities in nonattainment areas by reference to the standard used for the New Source Performance Standards, which defines modifications by reference to physical changes that significantly increase emissions). If the emissions increase does not result from a physical change in the facility, it is not subject to NSR. *See* 40 C.F.R. § 51.166(b)(2)(iii)(f) (2008) (stating that an increase in hours of operation or in the production rate does not equal a physical change in operation).

100. *See* MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD., *supra* note 31, at 13.

sions.[101] In addition, while greenhouse gas reduction measures are generally assumed to reduce co-pollutant emissions, some reduction measures could result in higher harmful emissions. For example, if a market mechanism created an incentive to switch from gasoline to diesel due to diesel's greater efficiency, the associated co-pollutants could increase, subject only to the partial controls imposed by the existing regulatory structure.[102]

Thus, a cap-and-trade program would allow facilities to buy greenhouse gas allowances that could incidentally lead to increases in existing co-pollutant emissions up to the level allowed by existing co-pollutant controls, and would therefore allow, and sometimes cause, increases in criteria and toxic pollutants. A cap-and-trade program's flexibility would allow co-pollutant emissions increases that a traditional approach to greenhouse gas regulation would not.[103] Presumably, a more traditional approach would require all facilities to reduce greenhouse gases, a reduction that would likely (although not certainly) reduce co-pollutant emissions at all facilities and thereby avoid the potential increases that a trading system could allow. These observations do not preclude the state from adopting a cap-and-trade program, but they suggests that the state must design the program to avoid co-pollutant emissions increases.

There is already some evidence that the law's environmental justice provisions are shaping implementation principles.[104] To jumpstart a market-based approach, Governor Schwarzenegger established a "Market Advisory Committee" (the Committee) shortly after AB 32 was passed.[105] The first guiding design principle articulated by the Committee was that a California cap-and-trade program should "[a]void localized and disproportionate impacts on low-income and disadvantaged communities or communities already adversely impacted by air pollution."[106]

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101. *See id.* ("It is conceivable that . . . the flexibility afforded by trading could cause a firm to shift production from one facility to another in order to reduce GHG emissions at a lower overall cost and that, because of differences in the industrial processes involved, this could lead to an increase in emissions of a local pollutant at one facility.").

102. In addition, new power plant technologies are reportedly being developed that would reduce greenhouse gas emissions but increase harmful particulate emissions.

103. *See* Kaswan, *supra* note 86, at 10301.

104. MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD., *supra* note 31, at 10 (stating that the Committee intended to recommend a system that was responsive to environmental justice concerns).

105. The Market Advisory Committee was created by Executive Order shortly after AB 32 was adopted. *See* Exec. Order No. S-20-06 ¶ 3 (Oct. 18, 2006), *available at* http://gov.ca.gov/index.php?/executive-order/4484.

106. MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD., *supra* note 31, at 11; *see also id.* at 16 (noting that, since some greenhouse gas mitigation strategies could implicate co-pollutant emissions, CARB should "anticipate and address concerns about emissions hotspots.").

ii. Provisions Requiring Environmental Co-Benefits

Preventing increases in co-pollutants is not the only environmental justice issue presented by climate change regulation. Since climate change regulation will produce a net decrease in greenhouse gas emissions and, presumably, their associated co-pollutants, another key issue is the distribution of the co-pollutant reduction benefits.[107] AB 32 contains relevant provisions.

The above-noted requirement to consider impacts on low-income areas[108] would include the requirement to consider whether greenhouse gas regulations decreased co-pollutant emissions in such areas. More specifically, AB 32 repeatedly requires the state to maximize the co-benefits of climate change regulation, including its environmental co-benefits. For example, the statute establishes the legislature's intent to "maximize[] additional environmental . . . co-benefits for California, and complement[] the state's efforts to improve air quality."[109] The special provisions guiding the design of a market-based system, if adopted, also state that CARB should "[m]aximize additional environmental and economic benefits for California, as appropriate."[110] Arguably, decreasing co-pollutant emissions is of greatest importance, and provides the greatest benefit, in the state's most polluted areas. In addition, AB 32 states that climate change regulations should complement "efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions."[111] AB 32 could thus require the state to implement its climate change programs to maximize co-pollutant reductions in the state's most polluted areas, where reductions would help the state achieve its air quality goals and provide the greatest environmental co-benefit.

AB 32's co-benefit requirements have influenced the principles articulated by the Market Advisory Committee in its recommendations for implementing a cap-and-trade program in California. The Committee's second guiding design principle states that a cap-and-trade program should "[a]void interference with the achievement of state and federal ambient air quality standards,"[112] suggesting that it should lead to reductions, not increases, in co-pollutant emissions in nonattainment areas. The Committee's third guiding design principle states, more generally, that a cap-and-trade program should maximize co-benefits, "including

107. *See* Kaswan, *supra* note 86, at 10302.

108. *See supra* note 88 and accompanying text.

109. CAL. HEALTH & SAFETY CODE § 38501(h) (West 2007); *see also* CAL. HEALTH & SAFETY CODE § 38562(b)(6) (West 2007) (requiring CARB to consider the implementing regulations' "overall societal benefits, including reductions in other air pollutants . . . and other benefits to the economy, environment, and public health.").

110. CAL. HEALTH & SAFETY CODE § 38570(b)(3) (West 2007).

111. *Id.* § 38562(b)(4).

112. MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD., *supra* note 31, at 11.

reducing other air pollutant emissions . . . ."[113] More specifically, the report states that California should distribute pollution allowances "in a manner that . . . advances the state's broader environmental goals by ensuring that environmental benefits accrue to overburdened communities . . . ."[114]

iii. Mechanisms for Incorporating Environmental Justice

The most complex environmental justice issues are raised by cap-and-trade programs, since they focus on aggregate pollution reductions that could lead to an uneven distribution of co-pollutant emissions.[115] In this section, I briefly outline the ways in which the state's environmental justice provisions could shape the ultimate implementation of a cap-and-trade program.[116] While it is too soon to see how California will implement its program, this summary suggests the significance that state-specific environmental justice policies could have on the implementation of climate change mitigation strategies.

One option for dampening the risk of co-pollutant increases and ensuring an equitable distribution of co-pollutant reduction co-benefits would be to impose traditional control requirements in addition to adopting a market-based system.[117] The regulatory agency could assess feasible control strategies and simply require that they be undertaken.[118] That approach could reduce greenhouse gas and associated co-pollutant emissions at all facilities at the outset, thereby avoiding emissions increases and widely distributing the co-pollutant reduction benefits of the regulatory system.[119] Thereafter, a cap-and-trade program could allow some variation in emissions among facilities, but all of the facilities would be starting from a lower baseline of co-pollutant emissions than would have been the case if a market-based system were the exclusive control mechanism.[120]

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113. *Id.*

114. *Id.* at 55.

115. *See* Kaswan, *supra* note 86, at 10294.

116. I have elaborated more fully on these potential mechanisms in other scholarship. *See id.* at 10304-08.

117. *See id.* at 10304-05 (discussing approach). Others have addressed this combination of trading and traditional approaches in the context of trading programs for non-greenhouse gas pollutants. *See* Richard Toshiyuki Drury et al., *Pollution Trading and Environmental Injustice: Los Angeles' Failed Experiment in Air Quality Policy*, 9 DUKE ENVTL. L. & POL'Y F. 231, 284-85 (1999); Johnson, *supra* note 76, at 162, 165; ENVTL. PROT. AGENCY, *supra* note 25, at 3-22, 3-25.

118. Kaswan, *supra* note 86, at 10304.

119. *Id.*

120. This approach could serve goals in addition to distributional justice. Trading programs to date have experienced difficulty in generating emission reduction incentives, since they have frequently set caps too high or distributed too many allowances. *See id.* at 10295-96. A traditional approach would ensure that all feasible reductions are undertaken, without waiting for the market to incentivize such steps. A market-based system could, thereafter, be used to create incentives for facilities to reduce emissions in new and innovative ways. *Id.* at 10304-05.

In addition, California's environmental justice provisions could be met by imposing conditions on trades to prevent increases and encourage decreases in co-pollutant emissions in areas suffering from serious air quality problems.[121] In a cap-and-trade system, the state could identify the areas suffering from adverse air quality and prohibit or limit trades of allowances into those areas.[122] Trades could be limited by increasing allowance prices for emissions in polluted areas, or by requiring a greater than one-to-one ratio of allowances to cover emissions, similar to the offset program for nonattainment areas.[123]

An additional mechanism by which the state could address the impact of a trading system on co-pollutant emissions would be to establish a fund to finance co-pollutant reductions in communities where emissions have remained the same or increased as a consequence of trading. Such a mitigation fund could be financed by auction proceeds.[124] The fund could be used to finance facility reductions, finance less-polluting public transit, or finance other mechanisms to reduce co-pollutants.[125]

California's environmental justice provisions could also implicate additional program parameters. Since allowances purchased from outside California do not result in in-state co-pollutant emission reductions, the state could consider some limitations on out-of-state allowance purchases.[126] (Such a restriction would be particularly controversial in the context of a national trading program.) In addition, the state could consider limiting the use of offsets from carbon sequestration activities, such as tree planting, since biological carbon sequestration activities do not lead to co-pollutant emission reductions.[127] Finally, the state could consider limitations on emissions banking, since emissions banking could

121. *See id.* at 10305-06. In considering mechanisms for limiting the adverse distributional impacts of a cap-and-trade program, others have noted the possibility of geographic limitations. *See* Drury et al., *supra* note 117, at 284; Johnson, *supra* note 75, at 162; ENVTL. PROT. AGENCY, *supra* note 25, at 3-22.

122. Regulatory agencies could also address adverse distributional impacts by reviewing and conditioning individual trades. *See* Kaswan, *supra* note 86 at 10305 (describing option). However, the additional administrative resources required for that approach would likely cause a significant interference with the market system's efficiency. Limiting trades based upon predetermined geographic boundaries would provide a more efficient mechanism for increasing distributional fairness. *Id.*

123. *Id.* at 10306. The Clean Air Act requires new or modified sources in nonattainment areas to obtain offsets for their emissions. 42 U.S.C.A. § 7503(c) (West 2008). The offsets generally exceed the proposed emissions, and, for ozone nonattainment areas, the ratio depends upon the severity of the nonattainment area. *See, e.g.*, 42 U.S.C.A. § 7511a(a)(4) (West 2008) (setting offset ratio for a marginal ozone nonattainment area). In that way, new facilities lead to a net benefit in air quality.

124. *See* Kaswan, *supra* note 86, at 10306; MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD., *supra* note 31, at 57.

125. *See* Kaswan, *supra* note 86, at 10306.

126. *See id.* at 10307.

127. *See id.*

allow facilities to save allowances for later use, resulting in higher co-pollutant emissions in the future.[128]

It is too soon to determine whether California's environmental justice provisions will actually lead to the integration of any of these proposals.[129] AB 32's environmental justice provisions may, however, have influenced the state's decision to adopt multiple early action measures that represent the state's commitment to a traditional regulatory approach.[130] In addition, the state's Market Advisory Committee proposed the mitigation fund option for reducing co-pollutants in its recommendations for a California cap-and-trade program.[131]

(b) Achieving Economic Justice for Disadvantaged Communities

AB 32 addresses not only the environmental implications of climate change policy for disadvantaged communities, but its economic implications as well. Climate change policies are expected to generate a variety of economic opportunities, including new technology development[132] and new employment opportunities associated with increasing the energy efficiency of our existing infrastructure.[133] To the extent possible, AB 32 requires the state to "direct public and private investment toward the most disadvantaged communities in California."[134] Achieving greenhouse gas reductions could require labor-intensive efforts to increase the energy efficiency of existing buildings, install solar or wind power, and take any number of additional steps.[135] Currently, there is a shortage of trained workers.[136] The state could "direct investment toward disadvantaged communities" by facilitating green-collar job training programs for

128. *See id.* at 10308.

129. The state is just beginning to develop its scoping plan for implementing AB 32, and held its first public workshop on potential policy mechanisms, such as direct regulation and market mechanisms, on January 16, 2008. The agency must adopt the scoping plan by January 1, 2009. CAL. HEALTH & SAFETY CODE § 38561(a) (West 2007).

130. *See* CAL. ENVTL. PROT. AGENCY, AIR RES. BD., CLIMATE CHANGE EARLY ACTION ITEMS, http://www.arb.ca.gov/cc/ccea/ccea.htm (last visited Mar. 27, 2008) (describing initial regulatory measures to achieve AB 32's goals). In its workshops on developing a scoping plan for AB 32 implementation, agency officials have emphasized direct regulation as an important component of the scenarios it is likely to consider. *See* Overview of Compliance Mechanisms for Emissions Reductions, http://www.arb.ca.gov/cc/scopingplan/meetings/1_16slides/session3mechanismsoverview.pdf (last visited Mar. 27, 2008) (stating that "[d]irect regulations are a major part of AB 32 implementation.").

131. *See* MKT. ADVISORY COMM. TO THE CAL. AIR RES. BD., *supra* note 31, at 57.

132. *See* Press Release, Office of the Governor, Gov. Schwarzenegger Signs Landmark Legislation to Reduce Greenhouse Gas Emissions (Sept. 27, 2006), http://gov.ca.gov/index.php?/print-version/press-release/4111/.

133. *See generally* Maxine Burkett, *Just Solutions to Climate Change: A Climate Justice Proposal for a Domestic Clean Development Mechanism*, 56 BUFF. L. REV. (forthcoming 2008) (describing need for green jobs in disadvantaged communities).

134. CAL. HEALTH & SAFETY CODE § 38565 (West 2007).

135. *See generally* Burkett, *supra* note 133, at 33-39 (proposing mechanisms for creating green jobs in disadvantaged communities).

136. David R. Baker, *State Has Serious Green-Collar Labor Shortage, Summit Attendees Say*, S.F. CHRON., Jan. 15, 2008, at C1.

unemployed workers in poor communities. In addition, meeting the technological demands for a new green society will require new industries. Green enterprise zones could be established in poor communities.[137]

4. Conclusion

This is not the place to evaluate the strengths and weaknesses of the proposed mechanisms for achieving environmental and economic justice. Policymakers will have to consider multiple factors in meeting AB 32's environmental justice provisions as part of an overarching efficient and effective greenhouse gas reduction strategy. What the list of proposals makes clear, however, is that a state's additional political and environmental goals could have a significant impact on the implementation of a cap-and-trade program specifically and greenhouse gas reduction policies more generally.

III. COOPERATIVE FEDERALISM MODELS

Having addressed the importance of federal legislation and the simultaneous importance of a vital state implementation role, the next issue is how to design federal legislation to address federalism concerns. Two key issues are presented by federal legislation: (1) who sets goals and standards (and whether federal legislation preempts state efforts); and (2) delegation of program authority.

Federal preemption of state goals, standards, or program parameters is a significant issue in federal climate change policy debates.[138] Facing the prospect of diverse state approaches, some industries have supported federal legislation as a mechanism for increasing consistency, and hence support preemptive provisions.[139] In contrast, states that have developed their own approaches are generally wary of state preemption.[140] If Congress decides not to explicitly preempt state efforts, the absence of an explicit preemption provision may not be sufficient to eliminate the risk of preemption. The courts have shown some tendency to find that Congress has implicitly preempted state efforts.[141] To avoid the risk of implied preemption, federal legislation must therefore include explicit savings provisions that preserve the states' ability to adopt more stringent standards.

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137. *See* Burkett, *supra* note 133, at 37-38.

138. *See* DeShazo & Freeman, *supra* note 2, at 1536 n.135 (discussing debate over preemption clause in cap-and-trade bill).

139. *See* Buzbee, *supra* note 28, at 1569-70; DeShazo & Freeman, *supra* note 2, at 1533-36.

140. *See* DeShazo & Freeman, *supra* note 2, at 1536 n.135 (observing that a preemption provision in draft federal climate change legislation was dropped due to lobbying from California officials trying to preserve their legislation).

141. *See* Glicksman, *supra* note 18, at 787-92 (describing courts' tendency to find implicit preemption).

A second critical federalism issue is the degree to which more general implementation authority is devolved to the states. Federal legislation would need to clarify both the limits to and the breadth of the state's implementation flexibility. Otherwise, questions could arise regarding the extent to which state-level initiatives conflict with the overarching federal program.

This Part analyzes the cooperative federalist features of proposed federal legislation, two existing climate change programs, and the federal Clean Air Act.

A. Proposed Federal Legislation

Of the many climate change bills introduced in the 110th Congress,[142] Senators Warner and Lieberman introduced the bipartisan bill receiving the most attention: America's Climate Security Act of 2007.[143] The bill establishes a federal emissions reduction goal for the covered sectors,[144] but explicitly preserves the rights of states to adopt and enforce their own greenhouse gas standards and requirements, so long as they are no less stringent than the bill's provisions.[145] By allowing states to set more demanding goals and standards, the bill gives the states the autonomy to realize state citizen preferences and fosters innovation, albeit at the cost of national consistency.

In terms of implementation, however, the bill is highly centralized. The heart of the bill is a national cap-and-trade program.[146] Under the bill, the federal government controls allowance allocation and is responsible for ensuring that facilities have sufficient allowances to cover their emissions.[147] The bill also establishes detailed parameters for the use of

142. At least six significant bills have been introduced in the Senate, and two in the House of Representatives. *See* LARRY PARKER & BRENT D. YACOBUCCI, GREENHOUSE GAS REDUCTION: CAP-AND-TRADE BILLS IN THE 110TH CONGRESS 2 (Cong. Research Serv. 2007), *available at* http://ncseonline.org/NLE/CRSreports/07Nov/RL33846.pdf. The Pew Center for Global Climate Change's website provides up-to-date information on proposed federal legislation. *See* Pew Center on Global Climate Change, *Climate Action in Congress*, http://www.pewclimate.org/what_s_being_done/in_the_congress/ (last visited Mar. 27, 2008).

143. S. 2191, 110th Cong. (2007).

144. *Id.* § 1201(d).

145. *Id.* § 9004(a) (any state can "adopt or enforce—(1) any standard, cap, limitation, or prohibition relating to emissions of greenhouse gas; or (2) any requirement relating to control, abatement, or avoidance of emissions of greenhouse gas") and § 9004(b) (stating, as an exception, that the states cannot adopt any such standards or requirements if they are less stringent than those imposed by the bill). The law also encourages states to adopt more demanding emissions limitations by allocating extra allowances to such states and permitting them to use the auction revenue for certain designated purposes. Two percent of the total allowances are to be distributed among states whose reduction targets exceed the federal targets and that have imposed more stringent limitations on their facilities. *Id.* § 3402. The states are entitled to use the proceeds from the sale of these allowances for a variety of designated purposes. *Id.* § 3403(c)(1).

146. *See id.* §§ 1101-3504 (outlining the federal cap-and-trade program).

147. *Id.* § 1201 (establishing allowances to be allocated each year, effectively establishing each year's cap); *id.* § 1202 (requiring facilities to demonstrate compliance to EPA).

offsets,[148] international trading,[149] emissions banking,[150] and emissions borrowing.[151]

While the bill's savings clause allows states to impose more demanding regulatory standards,[152] it does not appear to provide states with the authority to establish conditions on trades to control their potentially adverse distributional impacts and could prevent states from controlling other key political and economic variables. For example, the bill determines the ratio of free versus auctioned allowances,[153] a highly contested issue with significant ramifications. The federal government also controls most of the auction revenue.[154]

By including an explicit savings clause for state goals, the Warner-Lieberman bill takes a step toward cooperative federalism. The bill does not, however, provide a significant role for state implementation, or provide much guidance on how the federal government and the states can together achieve climate change goals.[155] Federal climate change legislation would benefit from more sustained consideration of how to enlist the strengths of each jurisdictional level.

B. Selected Cooperative Federalism Models

1. Climate Change Programs

The northeastern states' Regional Greenhouse Gas Initiative (RGGI) and the European Union's Emissions Trading System offer examples of climate change programs that are more decentralized than proposed federal legislation.[156] While a full examination of the role of federalism in the success or failure of these programs is beyond the scope of this article, the programs provide models worthy of further consideration.

(a) The Regional Greenhouse Gas Initiative

Under the RGGI program, a number of northeastern states have agreed to develop a regional cap-and-trade program for electric utili-

148. *Id.* §§ 2401-11 (Title II, Subtitle D, on offsets).
149. *Id.* §§ 2501-02 (Title II, Subtitle E, on international credits).
150. *Id.* §§ 2201-02 (Title II, Subtitle B, on banking).
151. *Id.* §§ 2301-03 (Title II, Subtitle C, on borrowing).
152. *See id.* § 9004 (outlining states' authority to set more stringent standards).
153. *Id.* § 3201 (listing the percentage of allowances to be auctioned each year from 2012 through 2050, referred to as "Allocation for Annual Auctions").
154. *See, e.g., id.* § 4302 (specifying the distribution of proceeds from the federal government's annual auction). Although the bill does allocate some allowances to states and provide them with a wide range of choices over how to spend the revenue from the sale of those allowances, *id.* §§ 3401-03, the vast majority of the allowances are controlled by the federal government.
155. Nor have any of the other bills proposed in the 110th Congress addressed the state role. *See* Robert B. McKinstry, Jr., John C. Dernbach & Thomas D. Peterson, *Federal Climate Change Legislation as if the States Matter*, 22 NAT. RESOURCES & ENV'T 3, 3-4 (2008).
156. *See* MEMORANDUM, *supra* note 4; *see also* EUROPA, EMISSION TRADING SCHEME (EU ETS), http://ec.europa.eu/environment/climat/emission.htm (last visited Mar. 27, 2008).

ties,[157] slated to begin operation in 2009.[158] The Memorandum of Understanding (MOU) embodying the agreement includes a mix of centralized and decentralized features. It establishes a regional emissions cap[159] and then translates the regional goal into state-specific caps.[160] The MOU does not explicitly preempt the states from setting more rigorous state-specific reduction goals if they so choose, but the states are unlikely to set more stringent goals since their interests were presumably already embodied in the state caps they negotiated under the MOU.[161]

The MOU, as well as the Model Rule the states negotiated to provide a template for each states' implementing regulations,[162] allows the states some implementation discretion. The MOU gives the states considerable discretion in the politically sensitive determination of how to allocate allowances. While it requires the states to auction a minimum of 25 percent of the allowances and to allocate the proceeds to a "consumer benefit or strategic energy purpose,"[163] the MOU does not otherwise appear to place constraints on the states' allocation rules and implicitly gives them the discretion to determine whether to auction or distribute the remaining 75 percent of their allowances. The states also retain permitting authority.[164]

In contrast, the MOU takes a highly centralized approach on other design features. For example, it requires all states to allow emissions banking "without limitation,"[165] and also requires the states to set a three-year compliance period.[166]

Other operational parameters appear to establish minimum requirements, without explicitly precluding states from taking a more stringent approach. For example, the RGGI program imposes limitations on the use of offsets, but does not explicitly prevent the states from imposing additional limitations.[167] Nor does the MOU or Model Rule address

157. *See* MEMORANDUM, *supra* note 4.

158. *Id.* § 3(C).

159. *See id.* § 2(B).

160. *Id.* § 2(C).

161. *See* Regional Greenhouse Gas Initiative, *Overview of RGGI CO_2 Budget Trading Program* 3 (Oct. 2007), *available at* http://www.rggi.org/docs/program_summary_10_07.pdf (observing that the state caps embodied in the MOU were negotiated among the states).

162. *See* Regional Greenhouse Gas Initiative Model Rule (Jan. 5, 2007), *available at* http://www.rggi.org/docs/model_rule_corrected_1_5_07.pdf

163. MEMORANDUM, *supra* note 4, § 2(G)(1).

164. *Overview of RGGI CO_2 Budget Program, supra* note 161, at 3.

165. MEMORANDUM, *supra* note 4, § 2(I).

166. *Id.* § 2(E)(1). In other words, every three years, sources must prove that they had enough allowances during the preceding three-year period to cover their emissions.

167. The MOU establishes "minimum," not final, offset eligibility requirements. *Id.* § 2(F)(1)(a). It indicates the type of offset projects that "may," not "must" be approved by a state, and indicates the terms under which offset allowances "may" be obtained from elsewhere within the United States, not that they "must" be accepted. *Id.* §§ 2(F)(1)(b), (2). The MOU also appears to give the states the authority to allow greater use of offsets as a "safety valve"—that is, to *allow* states to use more offsets if allowance prices increase past a certain point, rather than *requiring* them to allow the greater use of offsets. *Id.* § 2(F)(3)-(4).

whether states could impose limits on trading to help achieve co-pollutant reductions in heavily polluted areas.

Although the MOU and Model Rule do not explicitly preempt most state implementation variations, the states are nonetheless seeking consistency. One of the program's "guiding principles for program design" states that "[t]he program will emphasize uniformity to facilitate interstate trading in GHG allowances . . . ."[168] According to a New York State official, notwithstanding the MOU's potential flexibility, the states' are currently striving for as much uniformity as possible.[169]

The MOU indicates that if a comparable federal program is adopted, "the Signatory States will transition into the federal program."[170] However, one participating official indicated that the RGGI states do not want federal legislation to prevent them from meeting their unique goals or to undercut their implementation decisions.[171]

The RGGI program could provide important insights for future federal legislation. While the participating states have perceived the desirability of uniformity in a cap-and-trade program, the program nonetheless suggests that state-specific caps and allowing states to control allowance allocation are potential design options.

(b) The European Union's Climate Change Program

Under the Kyoto Protocol, the European nations agreed to reduce greenhouse gas emissions to eight percent below 1990 levels by 2012.[172] To meet their collective Kyoto Protocol goal, the European Union initially developed a "burden-sharing agreement" that establishes emissions goals for each state.[173] To address carbon dioxide emissions from certain energy-intensive sectors comprising about 45 percent of European emissions, the European Union established an Emissions Trading System (ETS).[174] The program commenced trading in 2005.[175]

168. Regional Greenhouse Gas Initiative, *Goals and Guiding Principles*, *available at* http://www.rggi.org/goals.htm (last visited Mar. 27, 2008).

169. Personal communication with Peter Iwanowicz, Director, Climate Change Office, New York State Department of Environmental Conservation (March 28, 2008).

170. MEMORANDUM, supra note 4, § 6(C).

171. Personal communication, Peter Iwanowicz, *supra* note 169.

172. LARRY PARKER, CONG. RESEARCH SERV., CLIMATE CHANGE: THE EU EMISSIONS TRADING SCHEME (ETS) GETS READY FOR KYOTO 2 (2007).

173. *See* PEW CTR. ON GLOBAL CLIMATE CHANGE, THE EUROPEAN UNION EMISSIONS TRADING SCHEME (EU-ETS) INSIGHTS AND OPPORTUNITIES 4-5 (2005), http://www.pewclimate.org/docUploads/EU-ETS%20White%20Paper.pdf. The percentage reductions for each country differ considerably, reflecting underlying economic and political circumstances in each state.

174. PARKER, *supra* note 172, at 1.

175. *Id.*

The current ETS approach embodies a relatively decentralized cooperative federalist approach.[176] The European Commission provides centralized principles and oversight but leaves key decisions to the member states.[177] Under the first two phases of the ETS, each state had the authority to establish its own emissions cap and to distribute allowances to covered sources,[178] subject to certain criteria established by the European Commission (EC).[179] In addition, the states can develop various conditions determining sources' eligibility for allowances, like requiring them to adopt existing greenhouse gas reduction technologies as a prerequisite to receiving allowances,[180] as well as other policies.[181] The states emissions goals, allocation decisions, and trading policies must be embodied in a National Allocation Plan, which must comply with a number of EC criteria and be approved by the EC.[182]

In addition to establishing certain general criteria and oversight over National Allocation Plans, the European Commission has largely dictated the choice between auctions and the free distribution of allowances, allowing states to auction only five percent in Phase 1 of the program (2005-08), increasing to ten percent in Phase 2.[183] Otherwise, however, the programs are generally quite decentralized in their central attributes.

As one commentator has noted, giving countries the authority to develop their own allocation plans has allowed them "to maintain substantial control over energy policy and related economic investment . . . ."[184] Decentralized state control has been controversial.[185] While it has allowed states to control decisions of critical political and economic importance, the member states have not been successful at reducing actual emissions.[186] Some states had inaccurate data on actual emissions and included overly optimistic growth projections, resulting in caps that were too high, flooding the market with allowances and failing to drive real

176. *See* JOSEPH KRUGER, WALLACE E. OATES, AND WILLIAM A. PIZER, DECENTRALIZATION IN THE EU EMISSIONS TRADING SCHEME AND LESSONS FOR GLOBAL POLICY 5 (Feb. 2007) (Resources for the Future Discussion Paper, RFF DP 07-02).

177. *See id.*

178. *See* PARKER, *supra* note 172, at 3.

179. *Id.*

180. *Id.* at 18. The practice of imposing threshold technology-based requirements has been termed "benchmarking." Given the difficulties of determining appropriate technologies, however, states have not generally pursued this option. *Id.* at 18. There is also some evidence that states have manipulated the technology requirements to favor in-state resources. For example, Germany imposed technology requirements that favor domestic coal and provide no incentive to switch to less-polluting fuels. *Id.* at 18-19.

181. The states can also set their own policies regarding how to allocate allowances to new sources, *id.* at 15, and on the marketability of emissions from facilities that have shut down. *Id.* at 17-18.

182. *Id.* at 3.

183. *See id.* at 13-14. States have varied in their use of auctions, with only a few choosing to auction any allowances in Phase 1 or Phase 2. *Id.*

184. *Id.* at 19.

185. *See id.* at 19-20; KRUGER, OATES, & PIZER, *supra* note 176.

186. *See* PARKER, *supra* note 172, at 6.

reductions.[187] In addition, states distributed allowances in a manner that favored in-state businesses and created competitive distortions.[188]

In designing Phase 3 of the European Union's program, slated to begin in 2013, the European Commission has recently proposed substantially revising the cooperative federalist approach to its trading program,[189] although it has retained a strong state role for other aspects of its climate change program.[190] According to a proposed plan issued in January 2008, the program will become more centralized. Rather than relying on the states to set their own caps, the European Commission will set a European Union-wide cap and eliminate the NAP process.[191] The states would remain responsible for distributing and auctioning allowances, but would do so under EU-wide rules and based upon EU-wide equity considerations.[192]

While the European Commission proposal for Phase 3 centralizes a formerly decentralized trading system, other aspects of the proposal continue to rely on member state actions. Since the trading program covers only about one-half of the European Union's emissions, with the remainder coming from sectors like buildings, agriculture, waste, and small facilities, the EC has set a European Union-wide emissions goal for the non-trading sector, but then intends to set more specific non-ETS reduction targets for each state.[193] The states would, however, be responsible for determining how to meet the target.[194] The European Union has also set a national renewable energy goal, but has then used numerous equitable and practical factors to determine state-specific goals.[195] The states themselves are to develop national action plans for meeting the EU's state-specific renewable energy goals.[196]

The EU's recent renunciation of a decentralized trading system suggests that determining the appropriate mix of federal requirements and state flexibility in a trading program requires care to ensure that state

187. *Id.* at 5-6. Thus, the cause of the ETS' initial failure could be partially attributable to inaccurate data, not the system's decentralized nature.

188. *See* Press Release, Europa, Questions and Answers on the Commission's Proposal to Revise the EU Emissions Trading System 2 (noting competitive distortions from state allocations) and 3 (noting that the decentralized approach led states to favor their own industries) (Jan. 23, 2008), http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/35&format=HTML&aged=0&language=EN&guiLanguage=en [hereinafter Europa].

189. *See id.*

190. *See* COMMISSION OF THE EUROPEAN COMMUNITIES, COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, AND THE COMMITTEE OF THE REGIONS 7 (Jan. 23, 2008), http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0030:FIN:EN:PDF.

191. *See* Europa, *supra* note 188, at 3.

192. *See* COMMISSION OF THE EUROPEAN COMMUNITIES, *supra* note 190, at 6.

193. *See id.* at 7.

194. *See id.*

195. *Id.*

196. *Id.* The European Council has articulated the importance of letting member states decide their own energy policy.

flexibility does not undermine federal objectives. Rather than eliminating the state role entirely, the ETS's difficulties could perhaps have been avoided by having the federal government, not the states, set each state's trading sector cap,[197] and by having stronger federal minimum requirements. The EU's proposed approach to the non-trading sector, in which it will establish state-specific goals but rely on the states to determine how to achieve them, could provide a useful model for the United States' domestic climate change policy.

2. The Clean Air Act

Cooperative federalism is nothing new in U.S. pollution policy: The nation's primary pollution control statutes, the Clean Air Act (CAA) and the Clean Water Act (CWA), rely on a cooperative federalist approach.[198] In this section, I focus primarily on the Clean Air Act because it provides a highly relevant model for future climate change legislation.[199]

The CAA establishes minimum federal air quality goals,[200] criteria pollutant controls for new sources everywhere and for existing sources in nonattainment areas,[201] and hazardous pollutant controls for both new and existing sources.[202] On the preemption front, it preserves state autonomy by explicitly allowing states to adopt more rigorous air quality goals and source controls.[203]

More broadly, the CAA devolves significant implementation authority to the states, giving the states the ultimate responsibility for achieving national air quality goals. The states must develop state implementation plans (SIPs) that demonstrate how the states will achieve federal goals through applying federal minimum requirements, applying

197. *Cf.* KRUGER, ET AL., *supra* note 176, at 7 (indicating the complexity of determining the relative economic efficiency of having the Member States or the European Union establish each state's trading-sector cap).

198. *See* Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141, 1174 (1995).

199. The Clean Air Act is, of course, not just a model for future climate change legislation, but a potential vehicle for current greenhouse gas controls. *See* McKinstry et al., *supra* note 155, at 3 (arguing that, with a few modifications, the existing Clean Air Act could be used to address climate change); McKinstry & Peterson, *supra* note 2, at 98-104 (same). Since it is an imperfect vehicle for a global, as compared with a local, pollutant, Congress is likely to choose a new approach to address climate change. I therefore treat the Clean Air Act as a model for future legislation.

200. The CAA requires EPA to establish National Ambient Air Quality Standards to protect the public health and the environment from the most pervasive and ubiquitous pollutants. 42 U.S.C.A. § 7409(b)(1) (West 2008).

201. EPA establishes New Source Performance Standards, minimum technology-based standards for certain categories of new sources. 42 U.S.C.A. § 7411(b)(1)(B) (West 2008). The Clean Air Act establishes additional criteria for permits for new sources, including requiring the Lowest Achievable Emissions Rate in nonattainment areas, 42 U.S.C.A. § 7503(a)(2) (West 2008), and installation of the Best Available Control Technology in attainment areas. 42 U.S.C.A. § 7475(a)(4) (West 2008).

202. 42 U.S.C.A. § 7412(d)(3) (West 2008).

203. 42 U.S.C.A. § 7416 (West 2008) (savings clause).

more stringent source controls as necessary, and taking other measures that may not be directly required under federal law.[204] This structure gives states the autonomy to respond to state-specific environmental conditions and preferences.[205] To provide a "check" on the state's implementation process, the federal government must approve the SIPs.[206]

The Clean Air Act experience also offers two models for cap-and-trade programs. The Acid Rain Program to address the long-distance transport of sulphur and nitrogen oxides is a highly centralized national program in which the Environmental Protection Agency (EPA) controls the nature and distribution of allowances.[207] In contrast, aspects of the cap-and-trade program under the Clean Air Interstate Rule (CAIR), a rule EPA developed to address the interstate transport of nitrogen oxides, sulfur oxides, and particulates,[208] are more decentralized. EPA establishes state-specific caps for each of the three trading programs created by CAIR and then gives states the option of achieving the reductions internally or participating in a regional cap-and-trade program.[209] States that choose to meet the nitrogen oxide cap by participating in a regional trading program must comply with model cap-and-trade rules, but retain considerable flexibility under those rules.[210] States can choose how to allocate allowances (by free distribution or by auction), how often to distribute allowances, the basis for allocating allowances, and can set aside allowances if they choose.[211] The CAIR program's decentralized structure suggests the potential viability of a more decentralized cap-and-trade program model than that currently contemplated by federal climate change legislation.

The Clean Air Act's cooperative federalism experience has not been an unqualified success: Despite general improvements in air quality, the states have often been resistant to federal mandates[212] and have often failed to develop state implementation plans that achieve federal air quality goals.[213] Conceivably, stronger federal minimums could have set the bar higher: The Clean Air Act has not been as rigorous for existing sources as it is for new or modified sources. In addition, notwithstanding

204. 42 U.S.C.A. § 7410(a)(1) (West 2008).

205. *See* Dwyer, *supra* note 54, at 1198.

206. § 7410(k)(1)(C).

207. 42 U.S.C.A. § 7651 (West 2008).

208. *See* Mack McGuffey & Gary R. Sheehan, Jr., *Taking Care of CAIR*, 20 NAT. RESOURCES & ENV'T 67 (2005).

209. *Id.*

210. *Id.* The trading program for sulfur oxides is integrated with the nationally run Acid Rain Program. *Id.*

211. *Id.*

212. *See* Dwyer, *supra* note 54, at 1199-1216 (describing state resistance to EPA's requiring states to address land use, transportation, and automobile inspection and maintenance programs in their SIPs); Percival, *supra* note 198, at 1161.

213. The extent to which many areas of the country continue to fail to attain air quality goals testifies to the states' failure to meet air quality goals. *See supra* note 84 (providing website showing the nation's nonattainment areas).

the importance of state flexibility in developing SIPs and the history of state resistance to federally-imposed SIP requirements,[214] the federal government may need to be even more detailed in its requirements and more aggressive in its enforcement. A full analysis of the role of federalism in contributing to the success or failure of the Clean Air Act is beyond the scope of this article, but would be a fruitful area for further inquiry.

Policymakers therefore have numerous cooperative federalist models to consider in designing future federal climate change legislation. The experience to date suggests that strong federal minimums are essential to effective policies. At the same time, it also suggests that it is possible, if not necessary, to provide states with some autonomy to address their state-specific goals and develop strategies for sectors that have historically been within their control.

IV. A PRELIMINARY SKETCH OF A COOPERATIVE FEDERALIST STRUCTURE

In this Part, I indicate how a national policy could establish a strong minimum federal response while retaining state autonomy. I first consider the goals and standards question, and argue that the federal government should set strong minimum goals, such as emission reduction goals and renewable portfolio standards (RPS),[215] but allow the states to exceed those goals. In addition, I argue that the federal government should set strong emission control standards but, again, generally allow states to exceed them (with some qualifications where consistency is a particular concern).

Setting goals and emissions standards alone are not likely to solve the problem of climate change, however. A cap-and-trade program could operate instead of or in addition to direct source controls. In this section, I analyze the particular federalism issues raised by a cap-and-trade program. But, since standards and/or a cap-and-trade program will only go so far in meeting the nation's emissions reduction goals, I consider the other mechanisms necessary to reduce emissions. The states could be key players in addressing the mix of state-specific strategies, including but not limited to standards and emissions trading. I thus discuss the potential role of state implementation planning as a key attribute of a cooperative federalist model.[216] These preliminary ideas are intended to generate an ongoing discussion about how to design a cooperative federalist structure that maximizes the benefits of our federal structure.

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214. *See* Dwyer, *supra* note 54, at 1199-1216.

215. A renewable portfolio standard is a legislative mandate which requires utilities to provide a minimum percentage of electricity from renewable energy sources. *See* DeShazo & Freeman, *supra* note 2, at 1523.

216. Many other implementation issues must, of course, be resolved, including permitting enforcement, and the like. I have focused on two of the most controversial issues in this article.

A. Climate Change Goals and Standards

1. Climate Change Goals

National action to set federal reduction goals is essential. Ideally, the national goal should reflect the level necessary to reduce net emissions to a sustainable level. However, federal legislation might focus only on reduction goals in particular sectors, not on setting an overall national goal.[217] Moreover, even if a bill were to set a national goal, opinions differ as to the necessary level.[218] Therefore, federal legislation should allow states to set their own reduction goals, as long as they are at least as stringent as the federal goal. As noted above, the Warner-Lieberman bill not only allows, but encourages, such an approach.[219]

Other goal-oriented federal programs, like renewable portfolio standards, could be designed similarly. The federal government could establish minimum national goals, but individual states could choose higher goals in light of their citizen preferences and state-specific renewable energy opportunities. Many states have already developed RPSs, and federal law could capitalize on that momentum.[220]

Federalism principles support strong federal minimum goals. As discussed above, states could fail to take sufficient action based on state-specific cost-benefit analysis, an analysis that could fail to take their impact on other states into consideration.[221] A strong national minimum would also overcome the other impediments to state action: the free

217. For example, the Warner-Lieberman bill, discussed above, establishes the goal of reducing emissions sufficiently to "avert the catastrophic impact of global climate change," S. 2191, 110th Cong. § 3(1) (2007), but it does not set a national reduction goal; it simply sets a cap on allowances for the following facilities covered under the cap-and-trade program: large facilities in the electric power sector, industrial sector, transportation fuel sector, and nonfuel chemical sector. *See id.* §§ 4(7) (defining "covered facility"), 1201(d) (establishing progressively declining cap for the covered facilities). A bill proposed by Senator Feinstein is even more limited, focusing solely on a cap-and-trade program for the electricity sector. The Electric Utility Cap and Trade Act of 2007, S. 317, 110th Cong. (2007).

218. For example, the bills introduced by Senators Kerry and Snowe, on the one hand, and by Senators Boxer and Sanders, on the other, both seek to stabilize atmospheric concentrations of carbon dioxide at 450 parts per million. *See* Global Warming Reduction Act of 2007, S. 485, 110th Cong. § 702(a)(1)(A) (2007) (Kerry-Snowe bill); Global Warming Pollution Reduction Act of 2007, S. 309, 110th Cong. § 702(1)(B) (2007) (Sanders-Boxer bill). However, the Sanders-Boxer bill assumes that emissions must be reduced to eighty percent below 1990 levels to achieve that goal, S. 309, § 704(c)(3), while the Kerry-Snowe bill assumes that goal can be achieved by reducing emissions only sixty-two percent below 1990 levels. S. 485, § 702(a)(1)(B) (establishing a goal of reducing to sixty-five percent below 2000 levels). The Pew Center on Global Climate Change has concluded that a sixty-five percent reduction below 2000 levels in equivalent to a sixty-five percent reduction below 1990 levels. *See* PEW CTR. ON GLOBAL CLIMATE CHANGE, ECONOMY-WIDE CAP-AND-TRADE PROPOSAL IN THE 110TH CONGRESS, http://www.pewclimate.org/docUploads/110th%20Congress%20Economy-wide%20Cap&Trade%20Proposals%2001-30-2008%20-%20Chart.pdf (last visited Mar. 27, 2008).

219. S. 2191, § 3402 (providing that states that set more stringent reduction goals could receive additional allowances).

220. *See* DeShazo & Freeman, *supra* note 2, at 1523.

221. *See supra* notes 17 to 18 and accompanying text (discussing likelihood that some states might find that the short-term costs of addressing climate change exceed its benefits).

rider problem, the race to the bottom, and the states' concerns about leakage.[222]

The importance of federal minimums does not, however, erase the significance of allowing states to set pollution reduction goals above a federal minimum. That would enable states to meet their citizens' preferences for strong action,[223] and provide a structural antidote to potential political failure at the federal level.[224] Since the goals themselves do not directly implicate national industrial operations, they do not raise the consistency concerns that might arise in connection with other types of regulatory measures. Leakage concerns may well deter the states from enacting more stringent goals, but that does not mean that the law should deprive them of that opportunity.

2. Efficiency and Emission Standards

(a) Product Standards

In the climate change context, a sampling of the types of product standards at issue includes appliance efficiency standards, vehicle emission standards, and, arguably, biofuels standards.[225] Federal legislation already addresses all of these areas and, in some cases, addresses preemption. Federal legislation in the 1970s gave the federal government the authority to set appliance efficiency standards, and that federal authority has been amended several times since.[226] The states can develop standards for products not covered by a federal standard.[227] Although federal law presumptively preempts state standards for appliances covered by federal standards, the states can develop more stringent efficiency standards if they obtain a preemption waiver from the Department of Energy.[228] Somewhat similarly, the Clean Air Act preempts state ve-

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222. *See supra* notes 11 to 12 and accompanying text.

223. *See supra* note 34 and accompanying text.

224. *See supra* notes 45 to 53 and accompanying text.

225. Vehicle emission standards are already addressed under the federal Clean Air Act, which preempts all states except California from adopting their own state standards, Clean Air Act, 42 U.S.C.A. § 7543(a) (West 2008), although it gives other states the choice of adopting the national or the California standard. 42 U.S.C.A. § 7507 (West 2008). California must, however, obtain a waiver of preemption from EPA before it can implement its own standards, § 7543(b), a waiver request that was rejected when California attempted to establish carbon dioxide emissions limits for mobile sources. *See* Zachary Coile et al., *EPA Blocks California Bid to Limit Greenhouse Gases from Cars*, S.F. CHRON., Dec. 20, 2007, at A1.

226. *See* John C. Dernbach, *U.S. Policy*, *in* GLOBAL CLIMATE CHANGE AND U.S. LAW 61, 69-71 (Michael B. Gerrard ed., 2007); APPLIANCE STANDARDS AWARENESS PROJECT, APPLIANCE EFFICIENCY STANDARDS IN THE 2007 ENERGY BILL: KEY FACTS (Dec. 2007), http://www.standardsasap.org/documents/2007EnergyBill_Standardsfactsheet.pdf.

227. APPLIANCE STANDARDS AWARENESS PROJECT, LEADING THE WAY: CONTINUED OPPORTUNITIES FOR NEW STATE APPLIANCE AND EQUIPMENT EFFICIENCY STANDARDS iv (2006) (observing that states can develop standards for products not governed by federal efficiency standards), *available at* http://www.standardsasap.org/documents/a062execsum.pdf.

228. *See* Dernbach, *supra* note 226, at 70; David Hodas, *State Initiatives*, *in* GLOBAL CLIMATE CHANGE AND U.S. LAW 343, 363 (Michael B. Gerrard ed., 2007). The state must demonstrate that

hicle emission standards,[229] but allows California to adopt divergent standards if it obtains a preemption waiver from EPA.[230] Federal energy legislation has set biofuels standards for the nation's fuel supply, but does not preempt the states' ability to set their own biofuels standards. Since future climate change legislation may revisit these standards and the preemption question, the discussion remains relevant.

As with federal emission reduction goals, federal minimum standards are appropriate due to the myriad potential political obstacles to sufficient state action.[231] In addition, the federal government may have more resources to engage in research,[232] and having all 50 states conduct the same research would be inefficient.[233]

Moreover, as discussed above, product standards, particularly for products in national commerce, do raise consistency concerns, since they could require individual plants to develop separate production lines to market their products in different states.[234] In addition, some states might develop product standards that are intended to protect state industries rather than the environment.[235]

Nonetheless, preemption has its costs: If the federal government is captured by special interests, it could fail to develop standards that some states believe possible and necessary.[236] Federal standards, once developed, might languish, rather than continually evolve.[237] In addition, companies operating in a global marketplace have survived the inconsistencies presented by differing countries' standards.[238] Thus, the best balance could be some form of limited, rather than complete, preemption. Federal control, through a waiver requirement, could control the multiplicity of standards. It could also provide a check against purely protectionist state standards.

The history of appliance efficiency and motor vehicle standards suggests that allowing limited state autonomy might be desirable, not-

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its more stringent regulation is needed to meet "unusual and compelling State or local energy" needs. *See id.* at 363-64.

229. Clean Air Act, 42 U.S.C.A. § 7543(a).

230. *Id.* § 7543(b).

231. *See supra* notes 9 to 19 and accompanying text.

232. *See supra* note 23 and accompanying text.

233. *See supra* note 22 and accompanying text.

234. *See supra* note 56 and accompanying text.

235. *See* Rabe, Roman & Dobelis, *supra* note 9, at 32-33 (discussing potential for state fuel standards to serve protectionist purposes). Mixed motives are, of course, possible. A state that promotes efficiency is likely to generate industries that achieve it. The issue would be whether the standard is a pretext that fails to achieve efficiency, not whether the standard would incidentally favor state industry.

236. *See supra* notes 47 to 49 and accompanying text.

237. For example, U.S. automakers face a variety of vehicle emissions standards in the global marketplace.

238. *See* McKinstry & Peterson, *supra* note 2, at 90.

withstanding consistency concerns.[239] After appliance efficiency standards were federalized in the 1970s, the federal government was slow to adopt standards.[240] Progress continued, however, because states—like California—continued to adopt stringent appliance efficiency standards.[241] Thus, innovation continued notwithstanding the federal paralysis.[242] Over time, increasing state activity created political pressure for uniform national efficiency standards, prompting federal efficiency standards for some products.[243] The cycle of diverse state standards prompting federal action was repeated recently, as states developed new standards in the early 2000s, leading Congress to require additional federal standards in the Energy Policy Act of 2005.[244] The states have thus served as laboratories of invention that have ultimately inspired national action.

Limited state autonomy has been productive in the automobile emissions context as well.[245] California has frequently taken advantage of its unique authority to set stricter vehicle emission standards.[246] As a consequence, the state has spurred innovation in the automobile industry that would not have occurred with a single federal standard.[247] Although EPA denied California's recent request for a waiver for its carbon dioxide vehicle emissions standards, commentators believe that EPA acted contrary to statutory provisions requiring that the waiver be granted and that the courts are likely to reverse the decision (if it is not reversed by administrative or legislative action before the courts act).[248] These considerations are likely to be relevant to the future preemption fate of state-set biofuels requirements, like California's low-carbon fuel standard,[249]

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239. *See* Engel, *supra* note 9, at 170-72.

240. *See* U.S. Gov't Accountability Office, Energy Efficiency: Long-Standing Problems with DOE's Program for Setting Efficiency Standards Continue to Result in Forgone Energy Savings, GAO Rep. No. 07-42, at 9 (2007), *available at* http://www.gao.gov/new.items/d0742.pdf; *see also* Engel & Saleska, *supra* note 6, at 225 (observing that the federal government did not set any efficiency standards because it did not believe they were economically justified); APPLIANCE EFFICIENCY STANDARDS IN THE 2007 ENERGY BILL, *supra* note 226 (noting that the first federal appliance efficiency standards were not set until 1987).

241. APPLIANCE STANDARDS AWARENESS PROJECT, *supra* note 227, at iii.

242. *See* Engel, *supra* note 9, at 170-72.

243. *See* APPLIANCE STANDARDS AWARENESS PROJECT, *supra* note 227, at iii; Engel & Saleska, *supra* note 6, at 225-26.

244. APPLIANCE STANDARDS AWARENESS PROJECT, *supra* note 227, at iv.

245. *See* Carlson, *supra* note 42, at 311-18 (discussing the value of California's autonomy to develop its own vehicle emission standards); Engel, *supra* note 9, at 187.

246. *See* CAL. ENVTL. PROT. AGENCY, AIR RESOURCES BOARD, FREQUENTLY ASKED QUESTIONS: EMISSION REDUCTION STANDARDS FOR VEHICLES, http://www.arb.ca.gov/cc/factsheets/ccfaq.pdf (last visited Mar. 27, 2008). California has set more stringent standards many times, and has almost always received a waiver from EPA to do so. *Id.*

247. Engel, *supra* note 9, at 187.

248. *See* Zachary Coile, *Behind EPA's Rejection of State Emission Rules*, S.F. CHRON., Jan. 24, 2008, at A-1. The recent motor vehicle saga suggests that waiver provisions should clearly set forth the circumstances in which waivers must be granted, rather than leaving the decision to pure federal administrative discretion. Otherwise, the states have no recourse against federal capture or inertia.

249. *See* Exec. Order No. S-01-07 (Jan. 18, 2007), *available at* http://gov.ca.gov/index.php?/print-version/executive-order/5172.

as the federal government increasingly sets national renewable fuels standards.[250]

The appliance efficiency and automobile standards cases indicate that allowing states to adopt their own standards, subject to federal oversight through a waiver provision, could prompt technological innovation and provide an antidote to the federal government's failure to act. Allowing limited state autonomy would also generate a more dynamic inquiry into what is technologically possible, countering potential bureaucratic inertia once standards are set.

(b) Pollution Control Standards

In light of the Supreme Court's 2006 ruling, in *Massachusetts v. EPA*, that greenhouse gases are "pollutants" under the Clean Air Act,[251] EPA likely already has the authority to control greenhouse gases by setting pollution control standards, like New Source Performance Standards and the standards associated with New Source Review.[252] As noted above, the Clean Air Act explicitly allows the states to set more stringent source controls.[253] Nonetheless, it is possible that a newly-proposed cap-and-trade program could preempt efforts to establish direct source controls for facilities covered by the cap-and-trade program.[254] It is also possible that the federal government will consider comprehensive climate change legislation that could explicitly or implicitly preempt state greenhouse gas controls, notwithstanding the savings clause in the Clean Air Act. The federalism issues presented by state pollution control standards therefore require consideration.

Ideally, federal legislation would establish federal minimums for existing and new facilities to ensure that all facilities adopt available mechanisms to reduce greenhouse gas emissions.[255] Such federal stan-

250. Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492. At present, the federal renewable fuels requirements and California's low-carbon fuel standard are quite different, since California's standard is intended to reduce lifecycle carbon emissions and the renewable fuels standards do not directly address carbon emissions. In fact, given the carbon intensity associated with generating corn ethanol, the federal standard might not be a low-carbon standard. *See* BRIAN T. TURNER ET AL., CREATING MARKETS FOR BIOFUELS 38 (2007), *available at* http://repositories.cdlib.org/its/tsrc/UCB-ITS-TSRC-RR-2007-1/ (concluding that ethanol from coal-fired facilities generates the same or more greenhouse gases as gasoline).

251. Massachusetts v. EPA, 127 S. Ct. 1438, 1460 (2007).

252. *See* McKinstry & Peterson, *supra* note 2, at 101 (regarding new source performance standards).

253. Clean Air Act, 42 U.S.C.A. § 7416(b) (West 2008).

254. For example, an early version of a bill to create a cap-and-trade program for the electricity sector would have explicitly exempted state regulation of that industry. DeShazo & Freeman, *supra* note 2, at 1536 n.135. Although deleted, the issue is likely to arise again. *Id.*

255. Unlike the federal Clean Air Act, federal legislation should direct EPA to set standards for all existing facilities, avoiding the federal loophole for existing facilities in attainment areas. *See supra* note 201 and accompanying text. In that respect, climate legislation could thus be modeled more on the Clean Water Act, which sets federal minimum standards for all existing sources. Clean Water Act, 42 U.S.C.A. § 1311 (West 2008).

dards would help avoid leakage concerns that the states might otherwise encounter were they to consider state-level regulation.[256]

Even if the federal government chooses to reduce emissions through a cap-and-trade program rather than direct regulation, federal legislation should grant states the power to establish direct greenhouse gas emission controls on stationary sources. States would thereby retain the ability to couple the trading system with direct regulations, based on both prudential[257] and equity concerns.[258] Allowing divergent state standards would allow states to meet more stringent goals (if they have them), allow them to operate as laboratories of invention, avoid bureaucratic inertia on the issue of what limitations are feasible, and provide an antidote to the risk of federal capture in setting federal standards.

The case for preempting more stringent production process standards is less compelling than that for product standards. In the product context, one industrial plant could face the specter of having to produce differing products to serve differing state requirements.[259] With production process requirements, in contrast, a facility located in one state would simply have to meet the requirements in that state, not a multiplicity of requirements.[260]

As with product standards, leakage concerns may make states reluctant to exercise their power to exceed federal pollution control standards. Nonetheless, I argue that they should retain the option to do so if they choose.

(c) Building Efficiency Standards

Building efficiency standards present one last example of a standard that could play a key role in greenhouse gas reductions. While the federal government would, ideally, set minimum standards, local variations in weather conditions and materials suggest that state and local entities should retain their long-standing authority to set more stringent standards. The building industry has long tolerated divergent local building standards, and federal consistency is less important for inherently decentralized building activities. Moreover, state and local governments are in a better position to enforce such broadly-applicable and dispersed standards.

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256. *See* McKinstry & Peterson, *supra* note 2, at 101.

257. The primary prudential concern is that the market would be ineffective at prompting facilities to take already-feasible steps to reduce emissions. *See* Kaswan, *supra* note 86, at 10295-96.

258. The equity concerns raised by a cap-and-trade program are those discussed *supra* notes 88 to 114 and accompanying text.

259. *See supra* note 56 and accompanying text.

260. *See* DeShazo & Freeman, *supra* note 2, at 1508.

B. Delegating Program Implementation

Federalism issues arise not only in connection with goals and standards, but in connection with program implementation. Many program parameters are implicated: If federal legislation seeks to meet emission reduction goals through a cap-and-trade program in addition to or instead of through direct source regulation, then the legislation must address the respective federal and state roles in operating the program. Since federal emission reduction goals are unlikely to be achievable solely through direct source regulation and/or a cap-and-trade program, and are likely to require state and local action, then some mechanism, like state implementation plans, will be necessary to stimulate the necessary state and local action and to determine how regulatory actions at multiple levels will ultimately achieve federal goals. In this article, I focus on these two parameters, but note that federal legislation will have to address other critical implementation issues as well, including permitting and enforcement systems.

1. Cap-and-Trade Programs

Federal legislation has generally envisioned a nationally-operated cap-and-trade program.[261] While there are undoubtedly benefits to having a national-scale trading program, those benefits do not erase the states' critical interest in the design and operation of cap-and-trade programs. A national cap-and-trade program could implicate the states' abilities to achieve state-specific emission reduction goals, their decisions about the most effective way to accomplish emission reductions, their decisions about how to reconcile environmental justice and economic efficiency goals, and their judgment about how to distribute the economic benefits and costs that could result from a trading program.

First, unlike RGGI or the European Union's initial ETS, I propose a presumptively national trading program. It is unlikely that all states would have the resources and will to set up their own programs.[262] Nonetheless, I suggest that states be given the option of establishing their own programs, subject to certain limitations. I propose that the federal government determine the state's maximum cap, rather than leaving full discretion to each state. Having a maximum cap set by the federal government rather than allowing states to freely set their caps would help avoid the inflated state-set caps experienced in the initial phases of the ETS.[263]

261. *See* PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 224.

262. *Cf.* Rabe, Roman, & Dobelis, *supra* note 9, at 11 (discussing some states' unwillingness to address climate change generally).

263. *See supra* note 187 and accompanying text (discussing excess allowances issued by European states).

Certain other features would likely need to be federally-controlled. Whether administered at the national or state level, a national registry of emissions, with a standard protocol for registering emissions, is likely to be necessary.[264] Ideally, monitoring protocols should be standardized, and the public should have easy access to information about all national trades.[265] With those federal parameters in place, a state could then be given discretion to decide how many of the allocated allowances it chooses to distribute and how.

State control over allowance distribution, and the ability to retire certain allowances, is critical to the state's autonomy to set its own goals and standards. Without such control, all of the flexibility to set varying standards discussed in the preceding section could be undermined. Unless a state can retire unnecessary allowances, a state that set a lower cap and required its sources to reduce by more than the national goal[266] would simply free up allowances that other states' sources could use, undermining the restrictive state's more demanding goals. In addition, if a state chose to regulate some sources directly instead of relying solely on a cap-and-trade program, it would similarly free up allowances that sources in other states would then use, undermining the reductions the state hoped to achieve through direct regulation.[267] A state could also be concerned that the national cap would be too high, and allowances too numerous, to create a strong enough price signal to prompt reductions and technological innovation. A state could therefore choose to retire some allowances in order to create higher allowance prices and further stimulate innovation.[268] Due to monitoring and enforcement concerns, a state might also choose a narrower sectoral scope for its trading program than that used in a federal program. If so, the state would want the dis-

264. The states have recognized this reality. More than half the states have agreed to participate in an emissions registry. Janet Wilson, *31 States to Track Warming: They Form a Climate Registry that Will Measure and Compile Greenhouse Gas Emissions by Industry*, L.A. TIMES, May 9, 2007, at A23.

265. In the event that federal legislation establishes weak monitoring protocols or does not require transparent information on trading, however, I would argue that states should have the authority to establish more rigorous requirements.

266. States could, alternatively, achieve more stringent state goals by requiring their facilities to obtain or purchase a higher ratio of allowances for each ton of emissions. That would effectively "retire" the excess allowances. It is also theoretically possible that reductions to be achieved as a consequence of more stringent state goals, or reductions achieved through state standards rather than trading, could be subtracted from the national cap rather than retired by individual states. *See* McKinstry et al., *supra* note 155, at 4 (observing that reductions achieved outside of a cap-and-trade program must be subtracted from the cap). Such an effort would, however, raise a number of complex practical and policy questions that would render it difficult to administer.

267. California, for one, is already engaging in regulatory efforts. *See supra* notes 93-99 (describing role of regulation in California's implementation of AB 32). While it may ultimately adopt a cap-and-trade program, the reductions to be achieved through the cap-and-trade program are likely to be less than would have been necessary had the state not combined the program with a regulatory effort.

268. Unless a state has a strong technology sector that hopes to benefit from such an approach, interstate competitiveness concerns are likely to render this approach unlikely. Ideally, the national cap would be low enough to set an appropriate nationwide price signal.

cretion to retire the allowances associated with the sectors that were not included in the state's program. Thus, a state's ability to retire allowances is necessary to give states real authority to adopt more demanding goals or standards.

State control over allowance distribution would also allow the state to control key political and economic variables—variables that could differ by state. States that chose to administer their own programs could retain some discretion about the degree to which allowances should be distributed for free or auctioned. Many factors are likely to influence a state's decision about how much and to whom to auction. The impacts of auctioning could vary considerably by industry, with differences in industries' ability to pass costs along to consumers. Different industries could also face differing competitiveness constraints, and pose varying risks of "flight" in reaction to auctioning.[269] States may also differ in their commitment to the "polluter pays" principle underlying an auction approach. Some states may also be concerned that distributing allowances for free could provide undeserved corporate profits.[270]

In order to allow states the freedom to auction, however, the federal government may need to establish strong minimum auction levels so that states do not fear that the decision to auction will undermine their competitiveness or generate leakage.[271] Under the RGGI program, for example, all states are required to auction a minimum of 25 percent of allowances.[272] Politically, however, the slowly increasing auction levels specified in proposed federal legislation may be all that can be expected.[273] States should thus retain the ability to auction more than the federal minimum.[274]

Auction revenues could also provide states with a key mechanism for addressing climate change and its regulatory impacts, including, for example, energy efficiency assistance to low-income consumers, worker training and retraining programs, research and development for new technologies, and adaptation financing.[275] Given the critical needs that could be filled with auction revenues, some federal guidance in the

269. *See supra* note 11 and accompanying text (discussing risk of leakage).

270. *See* Kaswan, *supra* note 86, at 10295. Complaints about "windfall profits" have tainted the European Union's trading system. *See* PARKER, *supra* note 172, at 14.

271. In the European Union's trading program, for example, few states have auctioned even the minimum five percent allowable in Phase 1, and few plan to auction up to the minimum ten percent in Phase 2. *See* PARKER, *supra* note 172, at 13-14. One of the innovations in Phase 3's more centralized program is to establish progressively increasing auction levels for the EU trading program. *See* Europa, *supra* note 188, at 3.

272. *See* MEMORANDUM, *supra* note 4, § 2(G)(1).

273. *See* America's Climate Security Act, S. 2191, 110th Cong. § 3201 (2007).

274. Many of the RGGI states are planning to auction well over the required 25 percent. *See Overview of RGGI CO_2 Budget Program*, *supra* note 161, at 4.

275. *See, e.g.*, Kaswan, *supra* note 86, at 10312 (describing certain environmental justice goals that could be met with auction revenues).

state's use of auction revenues would be useful.[276] Nonetheless, federal legislation could provide states that administer their own programs and choose to auction with some discretionary authority over how to use a portion of the auction revenues.

State control over a cap-and-trade program would also allow states to address the environmental justice implications of such programs in the event that federal legislation does not include sufficient protections. As discussed above, environmental justice provisions could, potentially, have a significant impact on the contours of a trading program.[277] States should therefore retain the ability to include trading limitations that achieve environmental co-benefits in disadvantaged neighborhoods. The limitations could include limits on trading into disadvantaged areas, limits on the use of offsets, and limits on international allowances that do not achieve domestic reductions.[278]

Unless federal legislation explicitly allows these types of restrictions, the courts could find that they conflict with the terms and goals of the national trading program and are therefore preempted.[279] For example, when New York attempted to regulate trades under the national Acid Rain Program due to air quality concerns, the Second Circuit held that the state's efforts were preempted by the national acid rain trading system, which did not impose geographic trading limitations.[280]

State implementation of a trading system could also help detect and prevent violations of traditional air permits. The states have the primary authority for administering air pollution permits under the Clean Air Act.[281] Separating the management of greenhouse gases from the control of harmful co-pollutants could increase the likelihood of undetected and unlawful increases in co-pollutant emissions. If the same agency were responsible for both greenhouse gases and their co-pollutants, it would be easier to confirm that changes in greenhouse gas emissions accomplished through a trading program did not violate co-pollutant permit requirements. Given the critical environmental consequences at stake, states should have the autonomy to control the operation of cap-and-trade

276. *See, e.g.*, America's Climate Security Act, S. 2191, 110th Cong. § 3403.

277. *See* discussion *supra* Part II.B. States might couple trading with direct regulation, limit trading into heavily-polluted areas, or take other measures to maximize the co-pollutant reduction benefits of climate change regulation. *Id.*

278. In order to encourage actual reductions within the regulated sector, the RGGI program places limits on the use of offsets. *See* Regional Greenhouse Gas Initiative, *supra* note 168.

279. Since the restrictions would likely reduce the cost-savings from trading, they could be found to conflict with a national goal of facilitating the lowest-cost reductions.

280. Clean Air Mkts. Group v. Pataki, 338 F.3d 82, 89 (2d Cir. 2003). State restrictions on national trades could also be found invalid under the dormant commerce clause. The district court in *Clean Air Markets* addressed this issue. Clean Air Mkts. Group v. Pataki, 194 F. Supp. 2d 147, 160 (N.D.N.Y. 2002). This constitutional question deserves attention but is beyond the scope of this article.

281. Clean Air Act, 42 U.S.C.A. § 7401 (West 2008); 40 C.F.R. § 70.1 (2006).

programs and to harmonize them with the states' other environmental objectives.

From a federalism standpoint, a decentralized cap-and-trade program is more controversial than decentralized goals, pollution control standards, or developing state implementation plans for climate action. An unencumbered national allowance market would likely be easier to administer than one that is national with respect to trading in some states and subject to state-based limitations in others. In addition, having different rules in different states would complicate the market's operation and have some impact on the market's economic efficiency goals. State-imposed constraints could impede some industries' ability to take advantage of nationally available low-cost emission reduction opportunities. The difficulties experienced in the European Union's decentralized trading system suggest the need for caution in allowing state variation within a national market.[282]

At the same time, a national cap-and-trade program that precluded state limitations would sacrifice critical state prerogatives. States would, in effect, lose control over their individual reduction goals or standards, which could be thwarted if they simply lead to the increased availability of allowances elsewhere. They would be unable to control the price signals that could prompt in-state technological innovation and development. And they would not be able to control the co-pollutant consequences of trading and the general distribution of environmental co-benefits. Not having control over whether to auction or freely distribute allowances would curtail their ability to address the economic impacts of trading, and, if they chose, their ability to adopt the "polluter pays" principle. Nor could they control the auction revenue stream.

These incursions on state autonomy are a high price to pay for national efficiency. Moreover, the proposal above would not lead to as much inefficiency as a purely state-centered approach; it would give states the option, not require them, to run their cap-and-trade programs. It is not clear how many states would accept the opportunity.[283] If relatively few did, then allowing some state autonomy would not have as large an impact on efficiency as 50 individual programs.

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282. *See supra* notes 185 to 188 and accompanying text.

283. Of course, if state-centered trading created control over auction revenues, it might provide states with a strong incentive to adopt their own programs. Those programs could use minimum federal guidelines, however, so state control over auctioning would not necessarily result in a multiplicity of inconsistent state rules. *See supra* note 192 and accompanying text (describing European Union's Phase 3 centralized rules coupled with decentralized auctions). This is not to advocate for centralizing rules to the extent proposed in the EU. But if minimum federal rules are adopted, then most states are likely to follow the federal rules, reducing the multiplicity of approaches that full decentralization could engender.

2. State Implementation Plans

Even a highly centralized federal program is likely to require a role for the states in achieving federal goals. Once federal legislation establishes a national emissions reduction goal, a key issue remains: How will it be achieved? First, many critical sectors are within state, not federal control, and a state implementation plan could demonstrate how the states will contribute their part to meeting national goals.[284] Second, in light of the delegation of standard-setting and program operations I propose, state implementation plans could provide a vehicle for collecting information on the state programs and providing federal oversight.

Although some policymakers appear to presume that a cap-and-trade program will provide a sufficient solution, a more multi-faceted approach is necessary.[285] The federal government cannot simply set the cap at the targeted reduction level and expect the market's invisible hand to efficiently guide the nation toward the required reductions.[286] Not all sectors are amenable to cap-and-trade: To operate efficiently and effectively, cap-and-trade programs are likely to be limited to major sectors in which emissions contributions can be effectively monitored. A cap-and-trade program is therefore unlikely to address small sources or sources where monitoring is difficult.

A cap-and-trade program is also unlikely to be a tool that could guide major components of a greenhouse gas reduction policy. To accomplish certain goals, like reducing consumer electricity demand, direct standards like building or appliance efficiency standards are likely to be more effective than relying on the market to trigger the necessary emission reduction incentives.[287] Since buildings consume 70 percent of the nation's electricity, increasing building standards could be a key mechanism for reducing greenhouse gases, and relying exclusively on the market to trigger private incentives for building green would be less predictable and effective than developing standards.[288] Increasing appliance efficiency is likewise unlikely to emerge effectively through a cap-and-trade program, except through the clumsy mechanism of increasing energy costs.

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284. *See* McKinstry et al., *supra* note 155, at 4-6.

285. *See id.*; McKinstry & Peterson, *supra* note 2, at 100-01.

286. *See* McKinstry et al., *supra* note 155, at 6 (describing market imperfections that are likely to prevent a cap-and-trade program from sending sufficient market signals to induce changes in consumer demand).

287. *See id.* (discussing why a cap-and-trade program is unlikely to be sufficient to reduce consumer demand).

288. Arguably, a cap-and-trade program that drives up energy costs could provide a private incentive for green buildings, without requiring a regulatory approach. However, operational costs are often less significant than capital costs in design decisions, dampening the impact of rising energy prices on building design.

Other key sources of greenhouse gases, like agriculture, land use patterns, and landfill practices, may similarly be less amenable to a cap-and-trade program, in part due to monitoring and verification difficulties.[289] Land use is the key driver of the nation's transportation-related emissions.[290] Transportation constitutes almost 28 percent of the nation's greenhouse gas emissions.[291] Even as cars have grown more efficient, the number of vehicle miles traveled has continued to increase, largely as a consequence of continued sprawl.[292] Reducing vehicle miles traveled through smart growth requirements and improved public transit is likely to be an essential component of an effective climate change policy,[293] and one that cannot be accomplished through a cap-and-trade program.

If setting a cap in a cap-and-trade program will not assure achievement of a national net reduction goal, then additional mechanisms will be necessary. However, many of the sectors that are not amenable to cap-and-trade are sectors that have historically been within state and local control, such as building standards, land use, and agricultural policy.[294] While minimum federal standards are appropriate where possible, the states should arguably be given a significant role in implementing policies over which they have had traditional control. For example, on both a political and a practical front, it is difficult to imagine how the federal government could establish and administer land use policy.

The federal government thus needs state planning to achieve federal goals.[295] The Clean Air Act's State Implementation Plans could provide

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289. *See* McKinstry et al., *supra* note 155, at 7. The agriculture and landfill sectors could conceivably be addressed by allowing facilities in a cap-and-trade program to purchase offsets from these sectors to meet their emission reduction targets. However, such programs are likely to be beset by significant permanence and verification issues that could preclude the use of offsets from the agricultural sector.

290. *See* Oliver A. Pollard, III, *Smart Growth and Sustainable Transportation: Can We Get There from Here?* 29 FORDHAM URB. L.J. 1529, 1531-32 (2002) (observing the role of post-World-War-II suburban sprawl in increasing motor vehicle use).

291. U.S. DEP'T OF TRANSP., CTR. FOR CLIMATE CHANGE AND ENVTL. FORECASTING, PERCENTAGE OF U.S. GREENHOUSE GAS EMISSIONS, 2005, http://www.climate.dot.gov.

292. *See* ROBERT PATERSON ET AL., TECHNIQUES FOR MITIGATING URBAN SPRAWL 10 (2003) http://www.utexas.edu/research/ctr/pdf_reports/0_4420_2.pdf (stating that VMT increased by almost 100 percent between 1969-1989, while population increased by only 22.5 percent); U.S. DEP'T OF TRANSP., RESEARCH AND INNOVATIVE TECHNOLOGY ADMINISTRATION, BUREAU OF TRANSP. STATISTICS, http://www.transtats.bts.gov/DL_SelectFields.asp?Table_ID=507&DB_Short_Name=VMT (last visited Mar. 27, 2008) (observing that national VMT increased almost 30 percent from 1990 to 2001).

293. *Cf.* Pollard, *supra* note 290, at 1549-50 (proposing denser development to reduce driving and its associated environmental impact).

294. *See, e.g.*, Dwyer, *supra* note 54, at 1217 (observing the need for a state role in areas like land use and natural resources law that have long been under state and local controls).

295. A federal law imposing a state planning requirement would have to avoid the constitutional limits on the federal government's ability to require the states to act. *See* New York v. United States, 505 U.S. 144, 175 (1992) (invalidating a state law that "commandeers" states to carry out federal statutes). The legislation could condition state funding on the completion of state plans, or as in the Clean Air Act, it could provide the states with the alternative of having the federal government prepare their plans for them. *See* Dwyer, *supra* note 54, at 1198-99 (observing that a state that failed to follow state requirements retains the "exit option" of having EPA assume responsibility).

a model.[296] Instead of focusing on achieving local air quality standards, the federal government could determine how much each state must reduce its emissions for the nation as a whole to meet its goals.[297] The process would presumably begin with a flat percentage reduction from a baseline. The states will undoubtedly expect other relevant factors to be taken into consideration, including some sort of credit for states that have already taken emission reduction steps,[298] as well as some recognition of the extent to which emissions are generated for the use of other states (a likely concern for power-generating states). The process is likely to be contested, but this article is not the place to resolve how each state's allocation should be set. It is also possible that setting state-specific allocations would be so contested that it would not be politically feasible.

Whether state-specific reduction targets are established or not, state planning to meet federal goals would nonetheless serve many useful functions, and would build upon the climate change planning efforts many states have already undertaken.[299] In a state implementation plan, the states could indicate how they have adopted any minimum federal standards or programs that have been established. Since federal minimum standards and programs are unlikely to be sufficient to reach federal emission reduction goals,[300] the states would have to indicate how they plan to address sectors within their control. Given that the sources of each state's greenhouse gas emissions differ markedly, states are likely to develop very different programs and to respond to state-specific conditions and priorities.[301] States that generate electricity are likely to

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296. *See* 42 U.S.C.A. § 7410 (West 2008). Kenneth A. Manaster & Daniel P. Selmi, *Federal Standards and State Implementation—State Implementation Plans*, 1 STATE ENVTL. L. § 6.5 (2007) (providing a basic description of state implementation plans).

297. McKinstry et al., *supra* note 155, at 7-8 (describing numerous potential variables for determining state reduction obligations). The process could be similar to the development of the "burden-sharing agreement" developed within the European Union, in which the European nations determined emissions goals for each state in light of the collective European goal established under the Kyoto Protocol. *See* PEW CENTER ON GLOBAL CLIMATE CHANGE, THE EUROPEAN UNION EMISSIONS TRADING SCHEME (EU-ETS): INSIGHTS AND OPPORTUNITIES 4-5 (describing burden-sharing agreement) (2005), *available at* http://www.pewclimate.org/docUploads/EU%2DETS%20White%20Paper%2Epdf.

298. *See* McKinstry et al., *supra* note 155, at 7 (suggesting that, in allocating emission reduction responsibilities to the states, states should receive early action credit); *cf.* Nicholas DiMascio, *Credit Where Credit Is Due: The Legal Treatment of Early Greenhouse Gas Emissions Reductions*, 56 DUKE L.J. 1587, 1593-98 (2007) (in the context of industry early action, discussing the general benefits and attributes of credit for early action of emissions reductions).

299. Many states are already creating climate action plans. *See, e.g.*, PEW CTR. ON GLOBAL CLIMATE CHANGE, STATES WITH CLIMATE ACTION PLANS, http://www.pewclimate.org/what_s_being_done/in_the_states/action_plan_map.cfm (last visited Mar. 27, 2008) (map indicating states with climate action plans).

300. *See* McKinstry et al., *supra* note 155, at 6 (emphasizing the importance of state implementation plans because "as is often the case, uniform national standards are not sufficient to achieve the needed reductions and additional reduction measures need to be undertaken.").

301. *See, e.g.*, Dwyer, *supra* note 54, at 1198 (stating that decisions about how to reduce air pollutants implicate significant political and economic issues); Brent Yarnal & Rob Neff, *Primary Sources of Greenhouse Gases: A Cross-Scale Comparison*, 12 PENN. ST. ENVTL. L. REV. 173, 178 (2004) (using the state of Pennsylvania as an example of how states can vary in their sources of

focus on that sector, and will have to determine whether a national cap-and-trade program will achieve sufficient reductions. States for which transportation is a significant component are more likely to focus on land use changes and public transportation, and to be more likely to adopt measures like California's vehicle emission standards if possible.[302] Cold states are more likely to focus on weatherization and energy efficient building codes than warm states. States could address the sectors uniquely within their control, and could play a key role in developing strategies to meet national goals.

In order to address the risk that states will fail to take the planning process seriously and fail to adequately generate reductions from the sectors under their control, the federal government will need to establish minimum SIP expectations. The states should be required to demonstrate regulatory actions in the sectors where change is inevitably necessary, like land use and transportation, notwithstanding the political controversy such controls are likely to generate.[303] Ultimately, the federal government should review and approve the states' implementation plans to ensure that they will lead to promised reductions. Since states may differ in their commitment to real and difficult climate change measures, federal oversight and enforcement is necessary to ensure that the states' plans are sufficient.[304]

A state planning process accords with federalism principles.[305] Minimum federal requirements and oversight could help overcome state inertia or internal political obstacles to state action. But providing the states with a role in determining how to implement reductions would allow those with the relevant information and expertise to devise strategies.[306] It would also give states leeway to broker the thorny political

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emissions and concluding that a national "mitigation strategy must take into account regional and local differences in emissions.").

302. In California, for example, transportation accounts for 39 percent of emissions and in-state electricity-generation for only 14 percent. CAL. ENERGY COMM'N, CALIFORNIA'S GROSS GHG EMISSIONS IN 2004, http://www.energy.ca.gov/global_climate_change/inventory/index.html (last visited Mar. 27, 2008). In contrast, the national averages are 27.7 percent for transportation and 33.5 percent for electricity-generation. U.S. DEP'T OF TRANSP., CTR. FOR CLIMATE CHANGE AND ENVTL. FORECASTING, PERCENTAGE OF U.S. GREENHOUSE GAS EMISSIONS, 2005, http://climate.dot.gov/ (last visited Mar. 27, 2008). Also, the future of California's greenhouse gas emissions standards for vehicles is in limbo, since California did not receive the necessary waiver of preemption from the U.S. Environmental Protection Agency. *See* Coile, *supra* note 240. However, the state has challenged EPA's waiver denial. *See* Bob Egelko, *State Sues EPA to Force Waiver over Greenhouse Gas Emissions*, S.F. CHRON., Jan. 3, 2008, at A-1.

303. *See* Dwyer, *supra* note 54, at 1206-08 (describing state resistance to including land use and transportation in their SIPs).

304. Ideally, federal legislation would create a less cumbersome bureaucratic process than the Clean Air Act's SIP review process. *See* Manaster & Selmi, *supra* note 296, § 6.5 (describing SIP process).

305. *See, e.g.*, Kaswan, *supra* note 1, at 79-85 (discussing the merits of a cooperative federalist approach).

306. *See* McKinstry & Peterson, *supra* note 2, at 87-88.

and economic challenges that addressing climate change involves.[307] Allowing state autonomy could also foster laboratories of invention as states struggle to change long-established patterns, such as unsustainable land use.

CONCLUSION

Federal legislation is clearly necessary to address climate change. The global nature of climate change presents too many obstacles to state action to expect the current momentum driving state programs to continue or to be sufficient.

Federal policymakers may be tempted to design a purely national program by its relative simplicity and in light of strong political pressures for federal consistency.[308] But the federal government cannot meet emission reduction goals by itself. The states are better able to address many of the relevant sources and sectors. Moreover, giving the federal government a monopoly over climate change policy would deprive the states of control over key political, economic, and environmental variables, deprive the nation of the technological and regulatory innovation benefits of multiple actors, and fail to provide a check on potential political capture.

A cooperative federalist system, despite its inherent complexity, provides a sounder model for federal climate change legislation. Almost all the nation's environmental laws recognize the importance of distributing power to both the federal government and the states. The fact that climate change is a more global environmental problem does not give the states any less interest in having at least some control over implementation decisions that will inevitably have far-reaching societal impacts.

307. *See* Dwyer, *supra* note 54, at 1198 (indicating the political significance of air pollution control implementation decisions and their impact on land use and economic development); *id.* at 1218 (stating that local political support and involvement is essential to the success of national environmental goals).

308. *See supra* note 139 and accompanying text.

GLOBAL RESPONSE TO CLIMATE CHANGE— FROM STOCKHOLM TO COPENHAGEN

ANITA M. HALVORSSEN†

INTRODUCTION

The anthropogenic effect on the climate system demands that strong action be taken now to avoid the worst impacts.[1] The tipping point before the onset of catastrophe is no longer decades away.[2] This is a global problem that calls for international cooperation on a scale comparable to the Marshall Plan after World War II to "reshape the world's future economy and redirect investment flows into a sustainable future" as Yvo de Boer, the Executive Director of the United Nations Framework Convention on Climate Change (UNFCCC) has stated the case.[3] The international community has produced the legal tools for dealing with the problem in the form of the UNFCCC[4] and the Kyoto Protocol to the UNFCCC (Kyoto Protocol),[5] yet these need to be amended to take into

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1. NICHOLAS STERN, *Summary of Conclusions*, *in* STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE vi (2007), *available at* http://www.hm-treasury.gov.uk/media/3/2/Summary_of_Conclusions.pdf [hereinafter STERN REVIEW: SUMMARY OF CONCLUSIONS].

2. *See* Jeremy Lovell, *Interview—The World Has Under Decade to Act on Climate Crisis*, REUTERS NEWS SERVICE, Nov. 22, 2006, *available at* http://www.planetark.com/dailynewsstory.cfm/newsid/39096/story.htm; *see also* Juliet Eilperin, *Debate on Climate Shifts to Issue of Irreparable Change*, WASH. POST, Jan. 29, 2006, at A1, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2006/01/28/AR2006012801021.html; Ian Sample, *Warming Hits Tipping Point*, THE GUARDIAN, Aug. 11, 2005, *available at* http://www.guardian.co.uk/climate change/story/0,12374,1546824,00.html.

3. Press Release, UNFCCC Secretariat, Latin American and Caribbean Countries to Play Key Role in Global Fight Against Climate Change (Feb. 1, 2008), *available at* http://unfccc.int/files/press/releases/application/pdf/20080201_santo_domingo_release_eng.pdf; *see also* UN News Service, *Joint Attack on Climate Change and Poverty Needed, Al Gore Tells Audience at UN* (Sept. 24, 2007), http://www.un.org/apps/news/story.asp?NewsID=23942&Cr=climate&Cr1=change#.

4. United Nations Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 849 (1994) [hereinafter UNFCCC]. The UNFCCC has near universal participation with 192 Parties as of August 22, 2007. *See* United Nations Framework Convention on Climate Change: *Status of Ratification*, http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php (last visited Mar. 28, 2008).

5. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 (2007) [hereinafter Kyoto Protocol]. As of January 15, 2008, there were 178 Parties to the Kyoto Protocol; *see also* Kyoto Protocol to the United Nations Framework Convention on Climate Change: *Status of Ratification*, http://unfccc.int/files/kyoto_protocol/background/status_of_ratification/application/pdf/kp_ratification.pdf (last visited Mar. 28, 2008) [hereinafter Status of Kyoto Protocol].

account the current status of the climate science and the international political situation.[6]

At the thirteenth Conference of the Parties to the UNFCCC (COP-13) in Bali in 2007, the international community recognized the seriousness of the climate change situation as stipulated in the Intergovernmental Panel on Climate Change's (IPCC) latest report by referring directly to the IPCC's Fourth Assessment Report in the Bali Action Plan, which stated that "warming of the climate system is unequivocal, and that delay in reducing emissions significantly constrains opportunities to achieve lower stabilization levels and increases the risk of more severe climate change impacts."[7] Now there is no longer any excuse for not taking urgent action.[8] The international community must be able to "deliver as one" if we are to have any chance in humanity's "war" against global climate change. However, as is usual in international law, multilateral cooperation takes time. All that was agreed to in Bali was an agenda, not a substantive agreement on the amounts of greenhouse gas (GHG) emissions that need to be reduced nor which particular states are to take these actions.[9] Reaching "an agreed outcome" and adopting a decision nearly two years from now, in Copenhagen in 2009, does not exemplify a leap to action considering the seriousness of the climate change problem. Yet, this was considered a success, mainly due to all the disagreements that have plagued the last few meetings.[10]

Among the many problems that need to be resolved, two deal with important equity issues that have plagued the climate change negotiations for a number of years. One problem is that the United States is not willing to commit to mandatory cuts in GHGs, and hence has not ratified the Kyoto Protocol. The other problem, closely related to the first, is that the emerging economies, the fast-growing developing countries such as India and China, do not have any mandatory cuts in the Kyoto Protocol,

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6. This article is, in part, based on an earlier article amending only the Kyoto Protocol. *See* Anita M. Halvorssen, *Common, but Differentiated Commitments in the Future Climate Change Regime—Amending the Kyoto Protocol to Include Annex C and the Annex C Mitigation Fund*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 247 (2007).

7. The text in Decision -/CP.13 is "[r]esponding to the findings of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change . . . ." *See* United Nations Framework Convention on Climate Change, Bali Action Plan, Decision -/CP.13, at 1 (Dec. 15, 2007), *available at* http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf (last visited Mar. 28, 2008) [hereinafter Bali Action Plan]; *see also* Intergovernmental Panel on Climate Change, Climate Change 2007: Synthesis Report, Summary for Policymakers (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf [hereinafter IPCC's AR4].

8. *See* Bali Action Plan, *supra* note 7, at 1 ("Recognizing . . . and emphasizing the urgency to address climate change as indicated in the Fourth Assessment Report . . . .").

9. *See generally* Robert N. Stavins & Joseph Aldy, Harvard Project on International Climate Agreements, Bali Climate Change Conference: Key Takeaways (Dec. 18, 2007), *available at* http://belfercenter.ksg.harvard.edu/publication/17781/bali_climate_change_conference.html (giving an overview of the Bali Climate Change Conference).

10. *See* Thomas Fuller & Andrew C. Revkin, *Climate Plan Looks Beyond Bush's Tenure*, N.Y. TIMES, Dec. 16, 2007, at 1, *available at* http://www.nytimes.com/2007/12/16/world/16climate.html.

even if they are Parties to the Protocol. These major economies will soon overtake the industrialized countries in amounts of GHG emissions.

In order to solve these two problems, this article posits amending the UNFCCC to include a new category of Parties—Annex III Parties—defined as emerging economies (the fast-growing developing countries). These countries will be able to commit to mitigation measures/emission cuts under a new Annex C of the Kyoto Protocol in return for financial and technological assistance provided by a new Annex C Mitigation Fund. Then, perhaps, the United States will feel compelled to ratify the Kyoto Protocol and comply with its stipulated reduction targets under Annex B of the Kyoto Protocol, allowing for a unified approach against global climate change. In order to make the Annex C Mitigation Fund more effective, this article also suggests that the Fund include a set of capacity-building teams, the Climate Change Corps (3Cs), as a special corps of volunteer engineers and climate scientists among others that would be set up by individual Annex I nations coordinated by the United Nations Development Programme (UNDP) in order to make sure these capacity-building teams are sent to the fast-growing developing countries that need them most urgently.

Part I of this article will give an overview of the status of the climate science and its impacts based on the IPCC's Fourth Assessment Report, since this has a bearing on the equity issues. The relationship between climate change and sustainable development, examined in Part II, will specifically address the equity principle of common, but differentiated responsibilities. Part III will analyze the roadmap and outcome of the international climate change negotiations at the Bali Conference. In Part IV, this article will examine the extent to which the amendments suggested to the UNFCCC and the Kyoto Protocol address the main barriers to having an all inclusive agreement to address the scourge of climate change.

I. OVERVIEW OF THE STATUS OF CLIMATE CHANGE AND ITS IMPACTS

The IPCC Fourth Assessment Report is a collaborative effort by hundreds of scientists from around the world assessing the current scientific knowledge about climate change.[11] In this Part, I will briefly present the IPCC and the findings of its reports, with the main focus being on the impacts, showing how they will affect developing countries disproportionately.

The IPCC was established in 1988 as an intergovernmental body by the World Meteorological Organization and the United Nations Environment Programme.[12] Its primary function is to provide decision-

11. Intergovernmental Panel on Climate Change, About IPCC, http://www.ipcc.ch/about/index.htm (last visited Mar. 28, 2008).

12. *Id.*

makers with an objective source of information about climate change by assessing "on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts and options for adaptation and mitigation."[13]

The IPCC has three main groups which each produce a report: Working Group I, which produces the report on the Physical Science Basis of Climate Change; Working Group II, which focuses on Impacts, Adaptation and Vulnerability; and Working Group III, which focuses on Mitigation.[14] In addition, the IPCC produces the Synthesis Report and other Special Reports.[15] Final reports are accepted at a Plenary Session of the IPCC and the Summaries for Policymakers are approved line by line.[16] The last steps in the procedure include a consensus by the international community.[17]

Working Group I of the IPCC's Fourth Assessment Report, which addresses the scientific basis of climate change, emphasized that "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."[18] The report states that "global increases in carbon dioxide concentration are due primarily to fossil fuel use and land use change, while those of methane and nitrous oxide are primarily due to agriculture."[19] The report also states that the "atmospheric concentration of carbon dioxide in 2005 exceeds by far the natural range over the last 650,000 years."[20] With greater scientific understanding since the Third Assessment Report, there is now "very high confidence that the global average net effect of human

13. *Id.*

14. Intergovernmental Panel on Climate Change, About the IPCC, How the IPCC Is Organized, http://www.ipcc.ch/about/how-the-ipcc-is-organized.htm (last visited Mar. 28, 2008); *see also* Intergovernmental Panel on Climate Change, About the IPCC, The IPCC Working Group I, http://www.ipcc.ch /about/working-group1.htm (last visited Mar. 28, 2008); Intergovernmental Panel on Climate Change, About the IPCC, The IPCC Working Group II, http://www.ipcc.ch/about/working-group2.htm (last visited Mar. 28, 2008); Intergovernmental Panel on Climate Change, About the IPCC, The IPCC Working Group III, http://www.ipcc.ch/about/working-group3.htm (last visited Mar. 28, 2008).

15. Intergovernmental Panel on Climate Change, IPCC Reports, http://www.ipcc.ch/ipccreports/index.htm (last visited Mar. 28, 2008).

16. Intergovernmental Panel on Climate Change, *Sixteen Years of Scientific Assessment in Support of the UNFCCC* 4, *available at* http://www.ipcc.ch/pdf/10th-anniversary/anniversary-brochure.pdf.

17. Intergovernmental Panel on Climate Change, Principles Governing IPCC Work 2, *available at* http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf.

18. WORKING GROUP I, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IPCC FOURTH ASSESSMENT REPORT, SUMMARY FOR POLICYMAKERS 5, *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf [hereinafter WORKING GROUP I REPORT].

19. *Id.* at 2.

20. *Id.*

activities since 1750 has been one of warming . . . ."[21] The report notes that "numerous long-term changes in climate," such as "changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts" have been observed.[22] The IPCC also states that the observed increases in average global temperatures since the 1950s are "very likely" due to the observed increase in human-induced GHG concentrations.[23]

Working Group II's report on impacts, adaptation, and vulnerability states that "[o]bservational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases."[24] Examples include increased numbers of glacial lakes, ground instability in permafrost, and changes in some Artic and Antarctic ecosystems.[25] The extent of drought-affected areas is likely to increase.[26] At lower latitudes, crop productivity is projected to decrease, leading to risk of hunger.[27] In Africa, 75-250 million people are expected to be exposed to an increase of water stress due to climate change by 2020.[28] The report also states that new studies confirm that Africa is one of the most vulnerable continents to climate variability and change, due to its many stresses and low ability to adapt.[29] The report further details that climate change will hamper sustainable development for most developing countries in Asia as it increases the pressures on natural resources and the environment in conjunction with rapid urbanization, industrialization, and economic development.[30]

Working Group II of the IPCC also addresses adaptation and vulnerability to climate change. In that context, the report explains that the future vulnerability to climate impacts is not only due to projected climate change, but also projected social and economic changes.[31] Other stresses exacerbate the vulnerability to climate change, such as poverty, unequal access to resources, food insecurity and incidence of disease (HIV/AIDS).[32] The projected number of people affected by climate change is greater in areas with low per capita income and large popula-

21. *Id.* at 3. "Very high confidence" means "at least a 9 out of 10 chance of being correct." *See id.* n.7.

22. *Id.* at 7.

23. *See id.* at 8. "Very likely" means more than 90 percent likely. *See id.* at 3, n.6.

24. WORKING GROUP II, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IPCC FOURTH ASSESSMENT REPORT, SUMMARY FOR POLICYMAKERS 8, http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-spm.pdf [hereinafter WORKING GROUP II REPORT].

25. *Id.*

26. *Id.* at 11.

27. *Id.*

28. *Id.* at 13.

29. *Id.*

30. *Id.*

31. *Id.* at 19.

32. *Id.*

tion growth, indicating that these areas are more vulnerable.[33] By increasing resilience and adaptive capacity, sustainable development can reduce vulnerability to climate change.[34] On the other hand, Working Group II states that climate change can delay the pace of progress toward sustainable development, either directly, through an increase in exposure to adverse impacts, or indirectly, due to erosion of the capacity to adapt.[35]

II. THE RELATIONSHIP BETWEEN CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

A. Sustainable Development

Sustainable development is most commonly defined according to the Brundtland Commission's Report as "development that meets the needs of the present without compromising the needs of future generations."[36] The need for balancing environmental and economic policies was first addressed in an international setting at the U.N. Conference on the Human Environment, held in Stockholm in 1972.[37] Since then the international community has met at the U.N. Conference on Environment and Development, held in Rio de Janiero in 1992, the Millenium Summit in New York City in 2000, and the World Summit on Sustainable Development, held in Johannesburg in 2002, to further highlight the importance of these issues and to take action.[38] Sustainable development is said to encompass three pillars: environmental, economic, and social aspects of development.[39] Climate change is a matter affecting these very same issues. In order to tackle climate change, the goal of sustainable development must be attained at a much faster pace, since economic growth produces the funding to mitigate and adapt to climate change. If this is not done, the impacts of climate change will destroy most of the progress made toward sustainable development. In the same way, economic growth that is not de-coupled from fossil fuel as an energy source will only lead to more GHG emissions. Just as was done in the case of the depletion of the stratospheric ozone layer, where developing countries were not ratifying the Montreal Protocol on Substances that Deplete the Ozone Layer until they were offered a delayed compliance schedule

33. *Id.* at 20.
34. *Id.*
35. *Id.*
36. *See* WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE 8 (1987) [hereinafter OUR COMMON FUTURE].
37. Philippe Roch & Franz Xaver Perrez, *International Environmental Governance: The Strive Towards a Comprehensive, Coherent, Effective and Efficient International Environmental Regime*, 16 COLO. J. INT'L ENVTL. L. & POL'Y 1, 7 (2005).
38. *Id.* at 9; Paolo Galizzi, *From Stockholm to New York, Via Rio and Johannesburg: Has the Environment Lost Its Way on the Global Agenda?*, 29 FORDHAM INT'L L.J. 952, 980, 988 (2006).
39. World Summit on Sustainable Development, Johannesburg, S. Afr., Aug. 26-Sept. 4, 2002, *Report of the World Summit on Sustainable Development*, 1, U.N. Doc A/CONF.199/20, *available at* http://www.unctad.org/en/docs/aconf199d20&c1_en.pdf.

and a specific funding mechanism,[40] we need to find solutions to the issue of climate change by crafting equitable bargains regarding economic and environmental issues between developed and developing countries. In the case of the Kyoto Protocol the fast-growing developing countries are Parties to the Kyoto Protocol, but they do not have any binding reduction commitments.

B. Equity—Common, but Differentiated Responsibilities

Addressing global environmental problems, in general, using treaties that require universal participation requires developed *and* developing countries to take on obligations. Under international law, countries have accepted the principle of sovereignty to include sovereign equality as reflected in the U.N. Charter, thereby giving all countries equal rights and obligations on the international plane.[41] Yet, to encourage universal participation and reflect the principle of equity in international law, these environmental treaties must provide differentiated responsibilities for developing countries. This is because developing countries historically have not had the same economic growth and social benefits as developed countries, and they have contributed to a lesser degree to the environmental problems.[42] This historical context, along with the developing countries' lack of capacity to address the environmental problems, has led to the idea of asymmetrical or differential rights and obligations for developing countries in international environmental law.[43]

The problem of the depletion of the stratospheric ozone layer was the first environmental problem regarding the atmosphere that was tackled on a global scale using differential treatment for developing countries.[44] In many ways, it was an easier problem to solve than climate change, since there were just a few manufacturers of ozone-depleting substances, as opposed to all consumers of fossil fuels, from utilities to school buses, being emitters of CO_2. Once they manufactured a substitute for chlorofluorocarbons (CFCs), an ozone depleting substance, the manufacturers were willing to produce it. Most of the countries that were big producers and consumers of CFCs ratified the Vienna Convention for the Protection of the Ozone Layer, followed by the Montreal Protocol on Substances that Deplete the Ozone Layer.[45] In the Montreal Protocol, the negotiating countries adopted an approach whereby all

40. *See* Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, S. Treaty Doc. No. 100-10, 1522 U.N.T.S. 3 [hereinafter Montreal Protocol].

41. U.N. Charter art. 2, para. 1 ("The Organization is based on the principle of the sovereign equality of all of its Members.").

42. ANITA MARGRETHE HALVORSSEN, EQUALITY AMONG UNEQUALS IN INTERNATIONAL ENVIRONMENTAL LAW: DIFFERENTIAL TREATMENT FOR DEVELOPING COUNTRIES 28-31 (1999).

43. *Id.* at 31.

44. *See* Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331, *available at* http://www.oas.org/DIL/Vienna_Convention_on_the_Law_of_Treaties.pdf [hereinafter Vienna Convention]; Montreal Protocol, *supra* note 40.

45. *See* Vienna Convention, *supra* note 44; Montreal Protocol, *supra* note 40.

countries were to take action, but developing countries were to have a delayed compliance schedule.[46] Shortly thereafter, the Montreal Protocol was amended to include a multilateral fund to facilitate the replacement of technology using CFCs in developing countries, thereby persuading India and China to become Parties to the Protocol.[47]

Historically, developing countries have had different developmental, social, and environmental needs and priorities and have not had the same economic benefits as the developed countries that have degraded the global environment in their process of industrialization. However, the picture in China and India is changing rapidly, since those countries are growing exponentially and experiencing immense environmental problems that need to be dealt with.[48] Yet, they are much more aware of environmental degradation than were the developed countries when they began industrializing, and to a certain extent, they are addressing their environmental problems using new, "cleaner" technology.[49] However, this is at a much too slow pace, mostly due to a lack of funding.

Even in this context, it is not equitable to demand that these developing countries have an equal share of the burdens of controlling GHG emissions when, until recently, they have not done most of the polluting.[50] This is because economic growth is still the primary strategy for eradicating poverty and should not be prohibitively restricted through the use of environmental controls.[51] Due to this principle of equity, asymmetrical or differentiated obligations for developed and developing countries have become the norm in international environmental treaties.[52] This equity principle is now often called "common, but differentiated responsibility" (CBDR) and is expressed in Rio Declaration Principle 7:

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46. *See* Montreal Protocol, *supra* note 40, at art. 5.

47. U.N. Env't Programme, Second Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, *Report of the Second Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer*, U.N. Doc. UNEP/OzL.Pro.2/3 (June 29, 1990), *available at* http://www.unep.ch/ozone/2mlonfin.shtml.

48. *See China Admits to Climate Failings*, BBC NEWS, Jan. 27, 2007, *available at* http://news.bbc.co.uk/2/hi/asia-pacific/6306881.stm.

49. *See* NATIONAL DEVELOPMENT AND REFORM COMMISSION, PEOPLE'S REPUBLIC OF CHINA, CHINA'S NATIONAL CLIMATE CHANGE PROGRAMME 31-32 (2007), *available at* http://www.pewclimate.org/docUploads/ChinaNationalClimateChangeProgramme%20June%2007.pdf.

50. Once CO_2 is emitted to the atmosphere, it remains there for at least a century. Hence, we are now seeing the effects of GHGs emitted since the industrial revolution. This constitutes, for the most part, pollution from developed countries, not developing countries. University Corporation for Atmospheric Research, Understanding Climate Change, Global Warming, Frequently Asked Questions, The Greenhouse Effect, http://www.ucar.edu/news/features/climatechange/faqs.jsp (last visited Mar. 28, 2008).

51. *See* OUR COMMON FUTURE, *supra* note 36, at 50-51; *see also* U.N. Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Rio Declaration on Environment and Development*, princ. 11, U.N. Doc. A/CONF.151/26 (Vol. I) (Aug. 12, 1992) [hereinafter *Rio Declaration*].

52. *See* Yoshiru Matsui, *Aspects of the Principle of "Common but Differentiated Responsibilities," in* 2 INTERNATIONAL ENVIRONMENTAL AGREEMENTS: POLITICS, LAW AND ECONOMICS 151, 166 (2002).

> States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.[53]

Despite the fact that the CBDR principle is not considered binding international law, it has become a cornerstone of burden-sharing structures adopted in international environmental treaties.[54] In the context of climate change, developed countries have historically contributed the most to the climate change problem and have the greater technological and economic capacity to address the problem, [55] whereas developing countries have not significantly contributed to climate change and are more vulnerable to its impacts because they lack the resources to address the problem. As a result, developed countries should take more responsibility for controlling GHG emissions.

The CBDR principle can also be seen as requiring obligations of solidarity assistance in the form of technology transfer and financial assistance.[56] To do this, developing countries would make the implementation of their commitments in environmental treaties conditional on the receipt of assistance from developed countries.[57] The UNFCCC already reflects this theory: "the extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology."[58]

The CBDR principle does have its limits, however. First, it is only meant to last for a limited time period to allow the developing countries to achieve the same level of economic growth as industrialized countries, while simultaneously addressing environmental issues.[59] It is not supposed to institute a permanent arrangement. Once the differences between the countries cease to exist, differential treatment should no longer be used.[60] Second, the CBDR principle should not be incompatible with

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53. *Rio Declaration*, *supra* note 51, at princ. 7.

54. Christopher D. Stone, *Common but Differentiated Responsibilities in International Law*, 98 AM. J. INT'L L. 276, 299-300 (2004); *see also* LAVANYA RAJAMANI, DIFFERENTIAL TREATMENT IN INTERNATIONAL ENVIRONENTAL LAW 127, 158 (2006).

55. PATRICIA W. BIRNIE & ALAN E. BOYLE, INTERNATIONAL LAW & THE ENVIRONMENT 101 (2d ed. 2002).

56. *Id.* at 102.

57. *Id.*

58. UNFCCC, *supra* note 4, art. 4(7). This commitment is reaffirmed in Articles 10 and 11 of the Kyoto Protocol. *See* Kyoto Protocol, *supra* note 5, arts. 10(b)-(e), 11.

59. HALVORSSEN, *supra* note 42, at 4, 29.

60. RAJAMANI, *supra* note 54, at 162.

the object and purpose of the treaty in question.[61] If implementation of the CBDR principle defeats the object and purpose of the treaty, it has gone beyond the limits of the treaty.[62] For example, the object and purpose of the UNFCCC is "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[63] This objective would be defeated if the developing countries' emissions of GHGs continue to grow to meet their development needs, leading to dangerous anthropogenic interference with the climate system. Thus, sustainable development requires that economic growth in *all* countries is balanced with the climate change objectives.

C. *Equity and Climate Change—The United States and the Fast-Growing Developing Countries*

In regards to climate change, the first equity problem is that the United States has not agreed to mandatory emission cuts and hence has not ratified the Kyoto Protocol. The stage was already set with a unanimous vote in the U.S. Senate in 1997, in which the Senate stated that it would not give its "advice and consent" to the Kyoto Protocol unless it included commitments to limit GHGs for developing countries and that the Protocol did not result in serious harm to the U.S. economy.[64] The Senate was concerned that the U.S. would be less competitive than major economies such as India and China if it ratified the Kyoto Protocol because these countries do not have any binding reduction commitments under the Protocol.[65]

In November 2008, the United States is electing a new President. No matter who she or he is, the future President will likely take climate change more seriously than President Bush. The three top contenders for the presidential race all call for mandatory cuts in carbon dioxide emissions, support a market-based approach that would set caps on carbon and other greenhouse gas emissions, and provide industries with tradable credits.[66] It would be convenient if the problem regarding the U.S. could be solved as easily as was the case of Australia, where a new government came into power in December 2007 and as his first official act, Prime

61. HALVORSSEN, *supra* note 42, at 29.

62. RAJAMANI, *supra* note 54, at 162.

63. UNFCCC, *supra* note 4, art. 2.

64. *See* Expressing the Sense of the Senate Regarding the Conditions for the United States Becoming a Signatory to Any International Agreement on Greenhouse Gas Emissions Under the United Nations Framework Convention on Climate Change, S. Res. 98, 105th Cong. (1997) (Byrd-Hagel Resolution).

65. *See id.*

66. American Association for the Advancement of Science, Science and Technology in the 2008 Presidential Election: Candidate Science & Technology Positions, http://election2008.aaas.org/comparisons/ (last visited Mar. 28, 2008) (click on each candidate's name; scroll down to the "Energy and Environment" section on web page).

Minister Rudd took the steps needed to ratify the Kyoto Protocol.[67] However, the new President will still need the "advice and consent of the Senate" before the instrument of ratification for the Kyoto Protocol can be signed.

The United States is the only Annex I Party (industrialized country) not to have ratified the Kyoto Protocol, though it has ratified the UNFCCC.[68] There are only 17 other states that are not Parties to the Kyoto Protocol, which currently has 177 Parties.[69] On April 23, 2008, only 16 Parties will not have ratified the Kyoto Protocol, as Iraq ratified it in January.[70] It seems rather unfortunate that the international community is supposed to draft a new agreement because the one remaining Annex I Party does not want to cooperate with most all of the international community which has agreed to, and worked diligently to operationalize, the Kyoto Protocol. That is not to say the Kyoto Protocol is perfect; it needs major improvements. Yet to set it aside is perhaps a bad idea at this urgent stage of climate change. Amending it seems a more viable option, taking into account all the structures, procedures and entities already set up in accordance with the Protocol. Amending the UNFCCC to add Annex III, thus arranging for fast-growing developing countries to have binding commitments under a new Annex C of the Kyoto Protocol, would save an enormous amount of time. The Kyoto Protocol is already structured in such a way that the industrialized countries, Annex I Parties, are to be subjected to more stringent commitments under Annex B of the Protocol for the subsequent commitment periods using its own amendment procedure.[71] Clearly a five percent average decrease in GHGs emissions stipulated for the first commitment period of the Protocol would not be enough to tackle climate change.[72]

The second problem, a related equity issue, concerns the fact that the fast-growing developing countries, such as China, India, and Brazil, do not have mandatory reduction commitments under the Kyoto Protocol. They are Parties to the Kyoto Protocol, but the Protocol only stipulates emission targets for Annex I Parties (industrialized states). How can one require developing countries that historically have not contrib-

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67. *Getting Serious in Bali: Talks on Tackling Climate Change Begin*, ECONOMIST, Dec. 3, 2007, *available at* http://www.economist.com/world/international/displaystory.cfm?story_id=10237931.

68. *See* Status of Kyoto Protocol, *supra* note 5, at 7. The Principality of Andorra and San Marino are considered to be developed States, but they are not listed as Annex I Parties in the UNFCCC. *See* UNFCCC, *supra* note 4, annex 1 (listing all developed countries but not including Andorra or San Marino).

69. UNFCC, Fact Sheet: The Kyoto Protocol, http://unfccc.int/files/press/backgrounders/application/pdf/fact_sheet_the_kyoto_protocol.pdf (last visited Mar. 28, 2008).

70. *See Iraq Ratifies Kyoto Protocol on Climate Change*, MIDDLE EAST TIMES, Jan. 26, 2008, *available at* http://www.metimes.com/Politics/2008/01/26/iraq_ratifies_kyoto_protocol_on_climate_change/afp/.

71. *See* Kyoto Protocol, *supra* note 5, art. 3(9).

72. *See id.* art. 3(1).

uted to global warming and are the most vulnerable to climate change, in addition to having the least capability or financial resources to deal with it, to also cut emissions on par with developed countries? This question becomes even more poignant when taking into account that the U.S. does not have any mandatory cuts because it did not ratify the Protocol.

D. Post 2012

The critical issue now is deciding which countries should take the main responsibility for reducing greenhouse gas emissions in the next phase, after 2012, when the first commitment period of the Kyoto Protocol comes to an end.[73] Is it sufficient to carry on with the existing Kyoto Protocol arrangement in which the current Annex I Parties[74] are to have more stringent commitments under Article 3 to be spelled out in Annex B[75] of the Kyoto Protocol? Or should the fast-growing, developing countries such as India and China —which emit more GHGs than several developed countries—also take on binding commitments for the second commitment period or soon thereafter? With the steadily growing emission of GHGs in India and China, it is clear that the international community cannot accept business as usual from *any* state.[76] All states have to pull their weight in the climate change context. But what does this mean for India and China?

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73. *Id.*

74. Annex I Parties constitute the developed countries, namely, most of the member countries of the Organization of Economic Cooperation and Development (OECD) and the countries with economies in transition (EIT). The Annex I Parties are listed at the end of the UNFCCC and include the following countries: Australia; Austria; Belarus; Belgium; Bulgaria; Canada; Croatia; Czech Republic; Denmark; European Economic Community; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Japan; Latvia; Liechtenstein; Lithuania; Luxembourg; Monaco; Netherlands; New Zealand; Norway; Poland; Portugal; Romania; Russian Federation; Slovakia; Slovenia; Spain; Sweden; Switzerland; Turkey; Ukraine; United Kingdom of Great Britain and Northern Ireland; and the United States of America. UNFCCC, *supra* note 4, annex I; *see also* Conference of the Parties on its Third Session, Kyoto, Japan, Dec. 1-11, 1997, *Amendments to the List in Annex I to the Convention Under Article 4.2(f) of the Convention*, Dec. 4/C.P.3, U.N. Doc. FCCC/CP/1997/7/Add.1 (Mar. 18, 1998), *available at* http://www.gcrio.org/OnLnDoc/pdf/kyoto_protocol.pdf (deleting Czechoslovakia from list and adding Croatia, Czech Republic, Liechtenstein, Monaco, Slovakia, and Slovenia).

75. Annex B Parties are Annex I Parties that have binding limitation or reduction commitments in the Kyoto Protocol. This list appears at the end of the Kyoto Protocol (the numeral is the qualified emission limitation or reduction commitment, a percentage of the base year or period for the first commitment period): Australia 108; Austria 92; Belgium 92; Bulgaria 92; Canada 94; Croatia 95; Czech Republic 92; Denmark 92; Estonia 92; European Community 92; Finland 92; France 92; Germany 92; Greece 92; Hungary 94; Iceland 110; Ireland 92; Italy 92; Japan 94; Latvia 92; Liechtenstein 92; Lithuania 92; Luxembourg 92; Monaco 92; Netherlands 92; New Zealand 100; Norway 101; Poland 94; Portugal 92; Romania 92; Russian Federation 100; Slovakia 92; Slovenia 92; Spain 92; Sweden 92; Switzerland 92; Ukraine 100; United Kingdom of Great Britain and Northern Ireland 92; and the United States of America 93. Kyoto Protocol, *supra* note 5, annex B. The Annex I and Annex B lists of countries are essentially the same. *Compare* UNFCCC, *supra* note 4, annex I, *with* Kyoto Protocol, *supra* note 5, annex B.

76. Neil Sands, *China, India Speed Climate Change: Australian Report*, YAHOO! NEWS, Feb. 21, 2008, http://news.yahoo.com/s/afp/20080221/sc_afp/australiaclimatewarmingreport.

The UNFCCC dictates in Article 3 that the CBDR principle is to be used for guidance.[77] By applying the CBDR principle, the Convention specifically stipulates in Article 4 that the developed countries are to "take the lead."[78] However, the UNFCCC does not give Annex I Parties (developed countries) any *binding* commitments; it only "urges" them to reduce their GHGs.[79] Non-Annex I Parties (developing countries), however, were not given such an "aim" to reduce GHGs, but the Convention does specify that non-Annex I Parties can take on voluntary commitments to do so.[80] However, all Parties were required to fulfill binding commitments to report on their national inventory of anthropogenic emissions and measures taken to implement the UNFCCC. The timetables for the reporting requirements were differentiated among the Parties: Developed countries were given a six-month deadline, developing countries were given three years, and the least-developed countries could report at their discretion.[81]

At the first Conference of the Parties to the Climate Convention, COP-1, in 1995, the Parties agreed in the Berlin Mandate that the commitments to reduce GHGs under the UNFCCC needed to be strengthened, but stipulated, again, that the Annex I Parties were to "take the lead."[82] As a result, the developing countries were not given any binding commitments to reduce GHG emissions in what became known as the Kyoto Protocol.

The core commitment of the Kyoto Protocol, stated in Article 3, also clearly captures the CBDR principle. That commitment requires Annex I Parties to reduce their overall emissions of GHGs by at least five percent below the 1990 levels in accordance with the reduction commitments specified in Annex B of the Kyoto Protocol.[83] Only Annex I Parties were given binding reduction commitments while non-Annex I Parties were not given any targets. This has been a point of contention for the U.S. ever since the Kyoto Protocol was adopted.

III. OUTCOME OF THE CLIMATE CHANGE CONFERENCE IN BALI IN 2007

A. Bali Action Plan

In response to the lack of binding commitments for developing countries, the international community finally, in 2005, at COP-11, agreed to start a series of "dialogues" to consider long-term cooperation under the UNFCCC "without prejudice to any future negotiations, com-

77. UNFCCC, *supra* note 4, art. 3(1).
78. *Id.* art. 4(2)(a).
79. *Id.* art. 4(2)(a)-(b).
80. *Id.* art. 4(2)(g).
81. *Id.* art. 12(5).
82. UNFCCC, *Report of the Conference of the Parties on Its First Session*, § I(1)(a), U.N. Doc. FCCC/CP/1995/7/Add.1 (Apr. 7, 1995) [hereinafter Berlin Mandate].
83. Kyoto Protocol, *supra* note 5, art. 3(1), annex B.

mitments, process, framework or mandate under the Convention."[84] At Bali in 2008, at COP-13, the Parties to the UNFCCC established the Ad Hoc Working Group on Long-term Cooperative Action (AWGLCA) as a subsidiary body under the UNFCCC.[85] This decision was made as part of the Bali Action Plan, which was adopted by the Conference of the Parties to the UNFCCC.[86] This plan constitutes one track of the Bali Roadmap.[87] The other track deals with the negotiations under the Kyoto Protocol, which will be covered in the next subsection. The Bali Action Plan was adopted by consensus after negotiating twenty-four hours overtime.[88] Tensions were high when the delegate from Papua New Guinea asked the U.S. delegation to "get out of the way" if it was not going to lead the way.[89] In the eleventh hour the U.S. delegation decided to be more flexible and joined the consensus which allowed for the adoption of the Bali Action Plan.[90]

The Bali Action Plan sets out a roadmap that includes four building blocks: mitigation, adaptation, technology transfer, and financial resources.[91] AWGLCA is to carry out a comprehensive process to enable the implementation of the UNFCCC through long-term action, starting now and going beyond 2012.[92] It is to produce an agreement that can be adopted at the 15th meeting of the Conference of the Parties (COP-15) in 2009 in Copenhagen.[93]

AWGLCA has a mandate to come up with a long-term *global* goal for emission reductions.[94] This has been lacking since the adoption of the UNFCCC. There were no specific numbers defining what constituted "dangerous . . . interference with the climate system."[95] Now the IPCC has stipulated that global emissions need to peak in 10-15 years and that emissions need to decline by 50 percent by 2050 in the most

84. UNFCCC, *Dialogue on Long-term Cooperative Action to Address Climate Change by Enhancing Implementation of the Convention,* ¶ 1, Decision -/CP.11 (Dec. 10, 2005) *available at* http://unfccc.int/files/meetings/cop_11/application/pdf/cop11_00_dialogue_on_long-term_coop_action.pdf.

85. Bali Action Plan, *supra* note 7, ¶ 2.

86. *Id.*

87. Bali Roadmap, Address to Closing Plenary by His Excellency Mr. Rachmat Witoelar, President, UN Climate Change Conference Closing of Joint High-Level Segment Bali (Dec. 15, 2007) *available at* http://unfccc.int/files/meetings/cop_13/application/pdf/close_stat_cop13_president.pdf.

88. *Summary of the Thirteenth Conference of Parties to the UN Framework Convention on Climate Change and Third Meeting of Parties to the Kyoto Protocol: 3-15 December 2007*, EARTH NEGOTIATIONS BULL. (International Institute for Sustainable Development, New York, N.Y), Dec. 18, 2007, at 15, *available at* http://www.iisd.ca/download/pdf/enb12354e.pdf [hereinafter ENB].

89. *Id.* at 16.

90. *Id.* at 20.

91. *Id.* at 19; *see also* Bali Action Plan, *supra* note 7, art.1(b)-(e).

92. Bali Action Plan, *supra* note 7, art.1.

93. *Id.*

94. *Id.* art. 1(a).

95. UNFCCC, *supra* note 4, art. 2.

stringent stabilization category (below 490 ppmv CO_2-equivalent).[96] Furthermore, Annex I Parties would need to reduce their emissions significantly by 2020 (10-40 percent).[97] These numbers were not, however, spelled out in the Bali Action Plan due to opposition from the U.S., Canada, Russia, and Japan, which did not want to prejudge the outcome of the process.[98] The Plan makes a reference to the Fourth Assessment Report of the IPCC, but only mentions "deep cuts" in global emissions will be needed to achieve the ultimate objective of the Convention.[99]

In regards to mitigation, AWGLCA is to consider mitigation commitments or actions, including quantified emission limitations and reduction objectives by all developed country Parties.[100] Developing countries are to have nationally appropriate mitigation actions in the context of sustainable development, supported and enabled by technology, financing, and capacity-building, in a measurable, reportable, and verifiable manner.[101] Policy approaches related to reducing emissions from deforestation and forest degradation are also supposed to be considered.[102] In regards to mitigation, AWGLCA is also to consider cooperative sectoral approaches and the use of markets.[103]

The Bali Action Plan calls for international cooperation to support urgent implementation of adaptation action using vulnerability assessments, financial-needs assessments, and capacity-building and response strategies, among others.[104] Risk management is promoted as well as insurance to transfer risks.[105] Furthermore, economic diversification is emphasized to build resilience.[106] In regards to technology transfer, AWGLCA is to consider means for removal of obstacles and provisions of incentives to scale-up the development and transfer of technology to developing countries, thus promoting access to affordable, environmentally-sound technology.[107] Enhanced action on the provision of financial resources will be based on consideration of improved access to adequate, predictable and sustainable financial resources for developing countries,

96. BRIAN FISHER & NEBOJSA NAKICENOVIC, ISSUES RELATED TO MITIGATION IN THE LONG-TERM CONTEXT 172, *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter3.pdf (last visited Mar. 28, 2008).

97. TERRY BARKER ET AL., CONTRIBUTION OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, TECHNICAL SUMMARY 90 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-ts.pdf.

98. ENB, *supra* note 88, at 15.

99. Bali Action Plan, *supra* note 7, pmbl.

100. *Id.* art.1(b)(i).

101. *Id.* art.1(b)(ii).

102. *Id.* art.1(b)(iii).

103. *Id.* art.1(b)(iv-v).

104. *Id.* art.1(c)(i).

105. *Id.* art.1(c)(ii).

106. *Id.* art.1(c)(iv).

107. *Id.* art.1(d)(i).

including new and additional resources and mobilization of private sector funding and investment.[108]

B. Negotiations Under the Kyoto Protocol

In the context of the Kyoto Protocol, the first Conference of the Parties serving as the Meeting of the Parties (COP/MOP-1) met in Montreal in 2005 and began negotiations on longer-term international cooperation on climate change.[109] They established a new subsidiary body, the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG).[110] According to Article 3, paragraph 9 of the Kyoto Protocol, commitments for subsequent periods—in other words after 2012 (after the first commitment period)—shall be established for Annex I Parties in amendments to Annex B of the Kyoto Protocol.[111] The negotiators at Bali considered the work of AWG to be the second track of the Bali Roadmap. At Bali, AWG agreed to spell out the target ranges stipulated by the Fourth Assessment Report of the IPCC, mentioned above,[112] which AWGLCA was not able to agree on.[113] This was to show that AWG's work would be guided by a "shared vision" of the UNFCCC's ultimate objective.[114] One of the main tasks of AWG was to develop a work program and timetable to guide the completion of its work in order to avoid a gap between the first and second commitment period of the Kyoto Protocol.[115] AWG was able to reach this goal, setting the deadline for 2009 when it will forward relevant decisions on Annex I future commitments for adoption by COP/MOP-5 in Copenhagen.[116]

IV. ANALYSIS OF THE AMENDMENTS TO THE UNFCCC AND THE KYOTO PROTOCOL

The Bali Roadmap does not specify what form of an agreement is supposed to be adopted in Copenhagen in 2009. Will there be a new framework convention with new goals on global emission reductions—long-term and short-term? There have been discussions that have considered setting commitments based on per capita emissions rather than

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108. *Id.* art.1(e)(i), (v).

109. Press Release, United Nations Framework Convention on Climate Change (Dec. 10, 2005) *available at* http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/press051210_cop11.pdf.

110. Ad Hoc Working Group on Further Commitments for Annex I Parties Under the Kyoto Protocol, http://unfccc.int/kyoto_protocol/items/3878.php (last visited Mar. 28, 2008).

111. Kyoto Protocol, *supra* note 5, art. 3(9).

112. *See* IPCC's AR4, *supra* note 7.

113. REPORT OF THE AD HOC WORKING GROUP ON THE FURTHER COMMITMENTS FOR ANNEX I PARTIES UNDER THE KYOTO PROTOCOL ON ITS RESUMED FOURTH SESSION 5 (2008), *available at* http://unfccc.int/resource/docs/2007/awg4/eng/05.pdf (last visited Mar. 28, 2008) [hereinafter AWG REPORT].

114. *Id.*; *see also* ENB, *supra* note 88, at 17-18.

115. AWG REPORT, *supra* note 113, at 5.

116. *Id.* at 8.

total emissions, and emission ranges have also been suggested.[117] Furthermore, emissions by sectors such as transportation and utilities have been considered.[118]

The goal of the international community must be to move much more quickly to act on climate change, especially now that we know that we do not have decades to figure out what to do.[119] This article proposes amending the UNFCCC to include "Annex III" to include the fast-growing developing countries that emit large amounts of GHGs.[120] The Annex III Parties would then have commitments under the Kyoto Protocol under a new "Annex C." Furthermore, a separate provision, Article 11-Bis, would be added to the Kyoto Protocol, entitled the "Annex C Mitigation Fund." This fund would specifically assist the fast-growing developing countries in achieving compliance with their new Kyoto Protocol commitments to be specified in Annex C.

Amending the UNFCCC and the Kyoto Protocol by adding Annex III, Annex C, and the Annex C Mitigation Fund would create the needed equitable bargain between developed and developing countries. This bargain would balance the primary interests of developing countries, such as economic development to eradicate poverty and address debt issues, with the primary interest of the developed countries to protect the climate system. Furthermore, it would operationalize the concept of sustainable development, which the international community agreed to implement through the Rio Declaration,[121] and Agenda 21, adopted at the Rio Conference in 1992.[122] Amending the UNFCCC and the Kyoto Protocol by adding Annex III, Annex C, and the Annex C Mitigation Fund would reflect the principle of common but differentiated responsibilities enunciated in the Rio Declaration. Ultimately, this proposal would promote sustainable development while upholding the stated objective of the U.N. Framework Convention on Climate Change: "stabilizing GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[123]

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117. *See generally* Kevin A. Baumert, Timothy Herzog & Jonathan Pershing, *Navigating the Numbers: Greenhouse Gas Data and International Climate Policy* (2005), http://pdf.wri.org/navigating_numbers_front.pdf.

118. *Id.*

119. *See* Press Release, United Nations Foundation, Science Panel Outlines Roadmap for Reducing Risks from Climate Change, (Feb. 27, 2007), *available at* http://www.unfoundation.org/media_center/press/2007/pr_22707.asp.

120. RAJAMANI, *supra* note 54, at 248.

121. *Rio Declaration*, *supra* note 51, art. 1.

122. Agenda 21, *available at* http://habitat.igc.org/agenda21/index.html [hereinafter Agenda 21]. Sustainable development is commonly defined as development "meeting the needs of the present without compromising the ability of future generations to meet their own needs." OUR COMMON FUTURE, *supra* note 36, at 8.

123. UNFCCC, *supra* note 4, art. 2. Article 2 states that the objective is

> to achieve, in accordance with the relevant provisions of the Convention, stabilization of the greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be

The UNFCCC and the Berlin Mandate both state that Annex I Parties should "take the lead."[124] This can be interpreted as implying that developed countries are to take a leadership role based on the CBDR principle. However, the ordinary meaning of "to take the lead" also implies that once the Annex I Parties (developed countries) have taken the first step, namely to fulfill their commitments in the first commitment period, then non-Annex I Parties (developing countries) are to "follow" with their own binding commitments, be they reduction commitments or limitations or other types of action.[125] This interpretation is drawn from the context of the UNFCCC's object and purpose of "stabilizing GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[126] Not taking drastic action now to stabilize the GHGs will lead to dangerous interference with the climate system.

Assuming Annex B Parties actually take the lead by fulfilling their obligations during the first commitment period of the Kyoto Protocol, developing countries (at least those emitting large amounts of GHGs) then need to follow with commitments of their own during either the second or third commitment period. It is becoming quite clear that, in terms of development, some developing countries, such as China and India, are growing much more rapidly than they were at the time the Kyoto Protocol was adopted in 1997. Consequently, they are emitting much greater amounts of GHGs than many developed countries. This new situation must be reflected in the Kyoto Protocol's commitments.[127] Given the scientific indications that climate change needs to be addressed urgently, all Parties that are major emitters of GHGs (both Annex I Parties and countries like China and India) must have binding commitments. Otherwise the object and purpose of the Climate Convention would be defeated: The international community would not be able to stabilize GHGs at a level that would prevent dangerous anthropogenic interference with the climate system.

If the major GHG-emitting developing countries are not given binding reduction commitments, the CBDR principle will have been taken beyond the limits of the object and purpose of the Climate Convention. However, it is important to stress that the assumption of binding commitments by major GHG-emitting developing countries is still contingent

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> achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Id.

124. *See* UNFCCC, *supra* note 4, art. 4(2)(a); *see also* Berlin Mandate, *supra* note 82, § I(1)(a).

125. Vienna Convention, *supra* note 44, art. 31.

126. *See* UNFCCC, *supra* note 4, art. 2.

127. At the COP-12 in November 2006, there was also mention that there be "wider and deepening participation" in regards to GHG reduction commitments. *See* ENB, *supra* note 88, at 11.

on the actions of the developed countries. The developed countries still need to "take the lead" by reducing their emissions during the first commitment period as dictated in Annex B and by committing to more stringent reduction targets for the second commitment period. On the issue of emission reduction ranges, Yvo de Boer stated in Bali that "[w]hat's becoming clear to me is the more robust industrialized countries are willing to be in terms of the effort they are working towards, the stronger the reaction you're likely to get from developing countries."[128] "If these commitments were watered down," he said, "G77 countries would be justified in asking why they should be more ambitious."[129]

A. Annex C

Using the Montreal Protocol as a model, the Parties to the Kyoto Protocol should amend the UNFCCC to create Annex III, a new category of Parties which would then have binding commitments under the Kyoto Protocol stipulated in Annex C. Annex III would include non-Annex I Parties with high levels of GHG emissions, such as China, India, and Brazil. Annex III Parties would have binding limitation, reduction, or mitigation action commitments under Annex C in the Kyoto Protocol starting in the second (2013-2017) or third commitment period (2018-2022), with a five-year delayed compliance schedule.[130]

Technically, Annex III Parties would have many of the same rights as Annex I Parties in the context of the Kyoto Protocol, yet in the context of the UNFCCC they would remain non-Annex I Parties.[131] Furthermore, Article 3 of the Kyoto Protocol, containing the core commitment, would be amended to include Annex III as follows: "The Parties included in Annex I and Annex III shall . . . ensure that their . . . emissions . . . do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments or mitigation action commitments inscribed in Annex B [and Annex C]."[132] As they grow and emit greater amounts of GHGs, additional developing countries would graduate into the Annex III category.[133] China and India would qualify right away to be included in Annex III, with commitments under

128. *See* United Nations Framework Convention on Climate Change, Previous Coverage from COP 13, http://unfccc.int/meetings/cop_13/items/4231.php (last visited Mar. 28, 2008).

129. *Id.*

130. This is assuming the commitment periods of the Kyoto Protocol are not extended beyond five years, but continue the pattern of the first commitment period.

131. Kevin A. Baumert, *Participation of Developing Countries in the International Climate Change Regime: Lessons for the Future*, 38 GEO. WASH. INT'L L. REV. 365, 390-91 (2006). Baumert explains this type of status in the context of parties taking on voluntary commitments through the use of the alternative process available in Climate Convention Article 4.2(g) for becoming an Annex I Party. *Id.* Yet, that status would be analogous to the status described here for Annex III Parties.

132. Kyoto Protocol, *supra* note 5, art. 3(1).

133. *See* Tadashi Otsuka, Professor, Waseda Univ., Tokyo, Japan, Presentation at the International Symposium: Legal Principles and Post-2012 Climate Regime (Dec. 17, 2006) (slides from presentation on file with author).

Annex C in the Kyoto Protocol. For some developing countries included in Annex III, there would only be obligations to take actions or measures to mitigate climate change, others would have a limitation on emission of GHGs and not a reduction requirement. Within Annex C, the amount of reductions or limitations would be differentiated, just as they are in Annex B among the developed countries.

An important question for further analysis is when the CBDR principle ceases to apply because the former developing country has reached a certain level of economic growth and is no longer different from developed countries. In regards to emissions, would the state then graduate from Annex C into the Annex B category, joining the other developed Parties? One would have to take into account the capacity of fast-growing countries to take on the same binding commitments as long-time developed countries. Furthermore, one would need to determine at what level of development China and India should leave the developing country classification and enter the ranks of developed countries.

B. Annex C Mitigation Fund

To complement Annex C, a new Annex C Mitigation Fund needs to be incorporated into the Kyoto Protocol as "Article 11-Bis," placed immediately after Article 11, the financial provision. This amendment would be adopted simultaneously with the amendments to include Annex III in the UNFCCC and Annex C in the Protocol in order to promote the early participation of Annex III Parties in fulfilling their new Annex C commitments. This new arrangement would depend on the political will of the developed countries, since to a large extent they would be funding the Annex C Mitigation Fund. This fund would have to be substantial to help the Annex III Parties receive technology transfers and other assistance much faster than provided by the current financial mechanism under the Climate Convention and the Kyoto Protocol that is operated by the Global Environment Facility.[134] The financing for the Annex C Mitigation Fund would come from a specific small fee charged in emission trading transactions. As a result, the funding would come from developed countries because Annex B Parties are currently the only Parties using the emissions trading mechanism. As Annex III Parties start to use the emissions trading mechanism, they would also participate in the funding of the Annex C Mitigation Fund.

Following the trend in the U.N. to partner with the private sector, the Annex C Mitigation Fund would not necessarily be run by the Global Environment Facility, but could be managed by an international private bank accountable to and guided by the COP/MOP. The goal would be to use the more efficient private banking system to track, manage, and disperse the funds earmarked for the financing of the incremental costs of

134. *See* UNFCCC, *supra* note 4, art. 11, 21(3); Kyoto Protocol, *supra* note 5, art. 11.

"clean" technology transfer and other assistance to Annex C countries. The chosen bank would already have adopted the Equator Principles.[135]

One could argue that fast-growing developing countries emitting large amounts of GHGs would be more likely to take on voluntary commitments than agree to binding commitments under Annex C. However, setting up a system in which developing countries with major economies are in a separate category seems more advantageous than subjecting them to the binding commitments under Annex B.[136] Furthermore, the Annex III/Annex C system includes the five-year delayed compliance schedule and the Annex C Mitigation Fund set up specifically for developing countries. The purpose of an Annex C Mitigation Fund is to facilitate the assumption of binding commitments by developing countries emitting large amounts of GHGs without having to slow down their economic growth in any drastic way, thereby promoting sustainable development.

C. Climate Change Corps

In order to make the Annex C Mitigation Fund more effective, a new set of capacity-building teams, an equivalent of the "Peace Corps"—the Climate Change Corps (3Cs)—should also be introduced. This special corps of volunteer engineers and climate scientists, among others, would be set up by individual Annex I nations. The 3Cs would be funded by the Annex C Mitigation Fund and coordinated by UNDP in order to make sure these capacity-building teams were sent to the fast-growing developing countries that needed them most urgently. The 3Cs would help facilitate the developing countries' move toward low-carbon sustainable development, by assisting with mitigating climate change at all levels, such as training in the area of fundamental research on climate change, assisting with GHG emissions monitoring systems, improving the ability to adapt to and assimilate transferred technologies, and facilitating in the invention and production of endogenous "clean" technology.

D. Kyoto Mechanisms

Regarding the Kyoto Mechanisms, Annex C Parties would be able to take advantage of *all* the flexible mechanisms. Currently, developing countries can only participate in the Clean Development Mechanism (CDM). Participating in all three mechanisms is important because being eligible to participate in emissions trading can help Annex III Parties economically, while at the same time fulfilling their reduction commit-

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135. The Equator Principles are guidelines for banks working in the project finance sector to ensure that projects are socially responsible and reflect sound environmental management practices. The Equator Principles (July 2006), *available at* http://www.equator-principles.com/documents/Equator_Principles.pdf.

136. Voluntary commitments could be adopted by first expressing to be bound by the Climate Convention, Article 4(2)(g), and then taking on commitments under Annex B of the Kyoto Protocol. UNFCCC, *supra* note 4, art. 4(2)(g); Kyoto Protocol, *supra* note 5, annex B.

ments. For instance, when they use energy efficiency to cut back on GHG emissions, they can sell the surplus credits and then use the revenue to fund new cleaner energy technology, making more credits available for them. However, Article 17 of the Kyoto Protocol would have to be amended to read as follows: "The Parties included in Annex B [and Annex C] may participate in emissions trading for the purposes of fulfilling their commitments under Article 3."[137] In the same manner, joint implementation would give the large GHG emitting developing countries the possibility of funding projects in the territory of other Annex I or Annex III Parties and receiving credits toward their own commitments.

In terms of the CDM, Annex III Parties, such as India with 33.33 percent of the program's projects,[138] would likely want to carry on as host countries to projects carried out under the CDM. Article 12 of the Kyoto Protocol specifically states that the mechanism shall assist Parties not included in Annex I.[139] In other words, Annex III Parties would continue to receive assistance in "achieving sustainable development and in contributing to the ultimate objective of the Convention" as specified in Article 12.[140] To achieve this, the text of Article 12 should be amended to read:

> The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I [and Annex III] in achieving compliance with their quantified emission reduction limitation and reduction commitments under Article 3.

Annex III Parties could continue to host CDM projects, helping them achieve sustainable development. At the same time, these Annex III Parties could also carry out CDM projects in other developing countries and use the credits they receive to comply with their Annex C limitation or reduction commitments. For CDM projects carried out by Annex B Parties in the territory of Annex C Parties, the credits would go to the Annex B Parties.

E. Amending the UNFCCC and the Kyoto Protocol

In order to incorporate Annex III into the UNFCCC and Annex C and the Annex C Mitigation Fund into the Kyoto Protocol, the Protocol would have to be amended by the Parties. To amend the Kyoto Protocol

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137. Kyoto Protocol, *supra* note 5, art. 17.

138. United Nations Framework Convention on Climate Change, CDM Statistics, Registration, http://cdm.unfccc.int/Statistics/Registration/NumOfRegisteredProjByHostPartiesPieChart.html (last visited Mar. 28, 2008). There are 948 registered project activities as of March 3, 2008. *Id.*

139. Kyoto Protocol, *supra* note 5, art. 12(2).

140. *Id.* This would allow developing countries to mature economically while taking social and environmental issues, including climate change, into account. *See* OUR COMMON FUTURE, *supra* note 36, at 8; *Rio Declaration*, *supra* note 51, princs. 3-5.

in order to incorporate the Annex C Mitigation Fund as Article 11-Bis requires that a proposed amendment be sent to the Parties at least six months before the COP/MOP where it would be proposed for adoption.[141] If the Parties to the Kyoto Protocol could not reach agreement by consensus, the amendment would be adopted by a three-fourths majority vote of the Parties.[142] The amendment would enter into force for the Parties that accepted it ninety days after at least three-fourths of the Parties deposited their instrument of ratification.[143] Adopting a new Annex III to the UNFCCC and Annex C to the Kyoto Protocol would follow the same procedure as for an amendment to the treaty and Protocol.[144]

CONCLUSION

The best result that can be hoped for to result from the COP-15 in Copenhagen in 2009 is to amend the UNFCCC and the Kyoto Protocol to get near universal participation in a more forceful way to address the enormous challenges of climate change, so every nation feels its concerns are addressed. The UNFCCC should be amended to include a new category of Parties—Annex III Parties—defined as emerging economies (the fast-growing developing countries). These Parties will be able to commit to mitigation measures/emission cuts under a new Annex C of the Kyoto Protocol in return for financial and technological assistance provided by a new Annex C Mitigation Fund. Then, perhaps, the United States will feel compelled to ratify the Kyoto Protocol and comply with its stipulated reduction targets under Annex B of the Kyoto Protocol, allowing for a unified approach against global climate change. This would go a long way in addressing the dilemmas of climate regulation and equity. It would also allow the fast-growing developing countries to move toward sustainable development, while at the same time address the scourge of climate change based on the efforts made by the developed countries to assist them financially and using effective mechanisms to provide them with affordable, environmentally-sound technologies.

141. Kyoto Protocol, *supra* note 5, art. 20(3).
142. *Id.* art. 20(4).
143. *Id.* art. 20(5).
144. *Id.* art. 21(3)-(4); *see also* UNFCCC, *supra* note 4, art. 15-16.

AMERICAN INDIANS, CLIMATE CHANGE, AND ETHICS FOR A WARMING WORLD

SARAH KRAKOFF†

Developing a sense of ourselves that would properly balance history and nature and space and time is a more difficult task than we would suspect and involves a radical reevaluation of the way we look at the world around us. Do we continue to exploit the earth or do we preserve it and preserve life? Whether we are prepared to embark on a painful intellectual journey to discover the parameters of reconciling history and nature is the question of this generation.[1]

INTRODUCTION

American Indian tribes and people have contributed very little to the causes of global warming, yet for geographic, cultural, and demographic reasons, they stand to suffer disproportionately from global warming's negative effects. A recent study, *Native Communities and Climate Change*, prepared by the Natural Resources Law Center at the University of Colorado Law School, documents that these effects include, among others, threats to traditional hunting and gathering, destruction of tribal villages in Alaska, increased pressure on tribal reserved rights to water in the arid Southwest, and inundation of reservation lands in Florida.[2] The disproportion between tribal contributions to global warming and the negative impacts on tribes qualifies this as an environmental justice issue.[3] As the *Native Communities and Climate Change* Report suggests, a complex of legal rights, in conjunction with Congress's moral obligation

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1. VINE DELORIA, JR., GOD IS RED: A NATIVE VIEW OF RELIGION 61 (2d ed. 1992).

2. JONATHAN HANNA, NATIVE COMMUNITIES AND CLIMATE CHANGE: PROTECTING TRIBAL RESOURCES AS PART OF NATIONAL CLIMATE POLICY 11-12, 19, 26 (Natural Res. Law Ctr., Univ. of Colo. Law Sch., 2007), http://www.colorado.edu/law/centers/nrlc/publications/ClimateChange Report-FINAL%20_9.16.07_.pdf.

3. *See* David H. Getches & David N. Pellow, *Beyond "Traditional" Environmental Justice*, *in* JUSTICE AND NATURAL RESOURCES: CONCEPTS, STRATEGIES, AND APPLICATIONS 25-26 (Kathryn M. Mutz et al. eds., 2002) (providing a definition of environmental justice in the natural resources context); *see also* Exec. Order No. 12,898, 59 Fed. Reg. 7629 (Feb. 11, 1994) (calling on federal agencies to achieve environmental justice as part of their mission and defining the problem as the "disproportionately high and adverse human health or environmental effects" of programs or policies).

to tribes, provides the foundation and incentive for the federal government to take action to address these impacts.[4]

Yet as important as it is to highlight its environmental justice aspects, global warming's spatial and temporal dispersions render it a global and intergenerational collective action problem that is not susceptible to typical environmental justice solutions. Global warming is caused by human emissions of carbon dioxide (CO_2) and other gases (methane, nitrous oxide, various hydrofluorocarbons, various perfluorocarbons, and sulfur hexafluoride) that trap heat that would otherwise be reflected back into the atmosphere.[5] The atmosphere is a global commons; no matter where in the world you are, your emissions contribute to its increasing insulating properties. Further, the atmosphere cannot be compartmentalized. For example, the fact that the United States has the highest historical greenhouse gas emissions[6] does not mean that our atmosphere is "thicker" and that we will suffer from global warming proportionately more than other countries. The spatial dispersion also means that reductions in one part of the globe can be rendered meaningless by increases in another part of the globe. If the total parts per million of CO_2 continue to rise overall, it does not matter where the parts come from. This spatial dispersion feature of global warming means that disparate effects from climate change cannot be redressed by targeting the emitters closest to the affected area. Furthermore, disparate effects cannot even be redressed by targeting only the biggest emitters. The commons aspects of climate change require all emitters to be part of a collective solution. These spatial collective action features are what prompt politicians to adopt the line: "Why should we reduce our emissions if China will soon render our efforts meaningless?"[7] While there are many appropriate rejoinders to this, including the imperative of moral leadership and the necessity of the United States leading the way in terms of technological solutions, the do-nothing position has, to date, prevailed as a matter of national policy.

Climate change's temporal dispersion adds an even more challenging aspect to the commons problem. Global warming is a severely temporally lagged phenomenon. CO_2, the most prevalent of the greenhouse gases, stays in the atmosphere for hundreds of years,[8] so most of the molecules added since the dawn of industrialization are still hanging around. As a practical matter, every molecule we add is one that is in-

4. HANNA, *supra* note 2, at 28-29.

5. Timeforchange.org, Cause and Effect for Global Warming, http://timeforchange.org/cause-and-effect-for-global-warming (last visited Mar. 27, 2008).

6. *See* Robert Collier, *A Warming World: China About to Pass U.S. as World's Top Generator of Greenhouse Gases*, S.F. CHRON., Mar. 5, 2007, at A1.

7. *See* LEE LANE & SAMUEL THERNSTROM, A NEW DIRECTION FOR U.S. CLIMATE POLICY: CREDIBLE ALTERNATIVES TO KYOTO 2 (2007), *available at* http://www.aei.org/docLib/20070201_EPOPosted_g.pdf (discussing the challenge of unifying politicians around effective climate policies).

8. Timeforchange.org, *supra* note 5.

creasing the thickness of our atmospheric blanket, because none are going away within a time frame that matters. This results in a lag between emissions increases and the effects on warming. The effects from today's blanket will be felt throughout the rest of the century (meaning increased warming and so on), even if we were to stop all carbon emissions today. Likewise, we are now feeling the effects not only of our own emissions, but of our parents' and grandparents.' Climate change is therefore an intergenerational collective action problem of potentially tragic proportions.[9] Each generation has incentive not to act, since the effects will be felt later. Yet only the current generation has the ability to take steps to avoid compounding the misery inflicted on future generations.[10]

Global warming's spatial and temporal dispersions render it a profound global and intergenerational collective action problem. Addressing the disparate effects warming will have on tribes and other disadvantaged communities leads us into these potentially tragic features of climate change, and requires us to articulate an ethical framework that would support global efforts to mitigate (i.e., reduce and eventually eliminate) human contributions to global warming, as well as to assist tribal communities in the already inevitable need to adapt to a warming world. Ultimately, solutions, if they are to take seriously environmental justice claims as well as the impacts at large, lie in the realm of sustainability. While that term has been overused, what I mean by it is the adoption of policies and practices that allow us to live within our ecological means and to distribute the benefits of development equally across human communities.[11] To provide redress as well as hope to the most disadvantaged communities, we should adopt policies and practices of sustainability worldwide. This brings us to the significant problem that, despite decades of discussion about sustainability and what it means, we have done relatively little to implement or achieve it. There are at least several explanations for this, each rooted in various understandings of human nature and the actual extent of resource scarcity.[12] Why, then, should anyone bother to try? The answer lies, I think, in the

9. *See generally* Stephen Gardiner, *A Perfect Moral Storm: Climate Change, Intergenerational Ethics and the Problem of Moral Corruption*, 15 ENVTL. VALUES 397 (2006).

10. *See id.*

11. *See* WORLD COMM'N ON ENV'T AND DEV., OUR COMMON FUTURE 4, 8-9 (1987) [hereinafter OUR COMMON FUTURE]. The report, edited by Gro Harlem Brundtland and therefore known as the Brundtland Report, provides a definition of sustainable development and outlines the principles and practices that would operationalize it on a global scale.

12. Some argue that most humans are not inclined to give up present benefits for the good of future generations. *See, e.g.*, Cass R. Sunstein, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 503, 503 (2007) (arguing that this accounts for why most Americans have not pressed for climate change policies). Others contend that the costs of taking action are too high and that we should invest in technological fixes to engineer our way out of environmental problems, including climate change. *See, e.g.*, Thomas Schelling, *Climate Change: The Uncertainties, the Certainties, and What They Imply About Action*, 4 ECONOMISTS' VOICE 3, 2-4 (2007), *available at* http://www.bepress.com/cgi/viewcontent.cgi?article=1276&context=ev.

kinds of lives we want to lead, the norms we want to aspire to, and the virtues we want to cultivate, irrespective of whether we will ever have any certainty that either the specific injustices suffered by American Indians or the broader effects that everyone will endure as a result of climate change will be redressed or avoided. Not coincidentally, a philosophical worldview that we might turn to for instruction as we navigate this new terrain is that embraced by many American Indian tribes.

This article will proceed by describing in Part I the place-based worldview held by most American Indian tribes. An understanding of this worldview, and the cultural and ethical practices that flow from it, is necessary to comprehend the disparate negative effects tribes will suffer from global warming. Yet, fittingly, the American Indian worldview may also provide the blueprint for life in a zero-emissions world. In Part II, I will summarize the particular effects on tribes in the four regions examined in the *Native Communities and Climate Change* Report, and also discuss the rights tribes possess that give rise to legal as well as moral claims for specific redress. In Part III, I will discuss the inevitability of a global approach to this particular form of environmental injustice, highlighting the possibilities for deepening our conception of sustainability and giving it ethical content that may be crucial to navigate the warming world we all face.

I. AMERICAN INDIAN CULTURE AND RELIGION: SPACE AND PLACE AND ALL THAT COMES FROM IT

Most modern American Indian nations do not have pristine landscapes. On a trip through Indian country, the following sights are not uncommon: trash swirling in parking lots; garbage piling up in washes; road-killed dogs lying bloating in the sun for days. Like all poverty-stricken places in the modern world, most Indian nations have trouble keeping the refuse of consumer life at bay. It is important to start on this note, because in describing the deep, vital, and complex environmental ethic that many tribes hold, I do not want to invoke the mythic, romantic Indian, perpetually at one with nature and free of taint and pollution. First, like all human communities, American Indians do not always act in perfect sync with their deeply held norms and beliefs. Second, the hardships of economic and cultural devastation visited on tribes throughout history have left them with a lot of garbage to clean up, figuratively and literally. Yet, remarkably, this history has not snuffed out traditional American Indian culture and religion, which carries on to this day. Part of Native tradition is to embrace their landscapes, whether battered or pristine. In short, American Indian people are not hard-wired to be any closer to nature or more environmentally sensitive than non-Indian people. But their traditional religious and cultural systems of meaning revolve around the earth and its values, and these long-held beliefs have influenced how American Indians view and interact with the land and the natural world.

In his book, *God Is Red: A Native View of Religion*, Vine Deloria, Jr., describes the philosophical and thematic differences between American Indian religions and western, Judeo-Christian religions.[13] One crucial difference is that of organizing principles: American Indian religions emphasize space while the Judeo-Christian religions emphasize time.[14] As Deloria explains, Judeo-Christian religions place great emphasis on the chronology of their story of revelation.[15] It is important, for example, that the savior appeared when he did, and that the spiritual message, good for the rest of time, was then revealed.[16] While particular places can take on sacred significance, such as the town of Bethlehem or the site of the crucifixion, they do so typically because of the historical events that took place there.[17] For American Indians, the place itself is sacred, and therefore the starting point for the system of beliefs and ethics that generate from it: "American Indians hold their lands—places—as having the highest possible meaning, and all their statements are made with this reference point in mind."[18]

This spatial aspect to American Indian religion gives different content to revelation. The place reveals its meaning, through communion and ceremony, to religious practitioners on an ongoing basis. The content of that revelation may vary, as different behaviors may be necessary to behave rightly toward a place depending on the season, year, or era. As Deloria writes:

> The structure of [American Indian] religious traditions is taken directly from the world around them, from their relationships with other forms of life. Context is therefore all-important for both practice and the understanding of reality. The places where revelations were experienced were remembered and set aside as locations where, through rituals and ceremonials, the people could once again communicate with the spirits. Thousands of years of occupancy on their lands taught tribal peoples the sacred landscapes for which they were responsible and gradually the structure of ceremonial value became clear. *It was not what people believed to be true that was important but what they experienced as true. Hence revelation was seen as a continuous process of adjustment to the natural surroundings and not as a specific message valid for all times and places.*[19]

Christian revelation, by contrast, issues at a specific time to a specific listener, and is literally "the gospel" until a chronologically subsequent

13. *See generally* DELORIA, *supra* note 1.
14. *Id.* at 122.
15. *Id.* at 98.
16. *See id.* at 104.
17. *See id.* at 67.
18. *Id.* at 62.
19. *Id.* at 66-67 (emphasis added).

amendment.[20] (Some branches of western religions do not adhere to the possibility of modern amendment by revelation, while others do.[21])

Because most American Indian religions have this place-centric aspect, there is a corresponding totality to the role that religion has in Indian life. A place generates not just a list of rules to follow, but a whole life's worth of attitudes and behaviors: "Tribal religions are actually complexes of attitudes, beliefs, and practices, fine-tuned to harmonize with the lands on which the people live."[22] As Deloria implies, there is even something misleading about calling traditional American Indian beliefs and practices "religion," because it implies segregation from the rest of life.[23]

The place-based nature of American Indian religion and culture has come to legal and public consciousness as a result of conflicts over sacred sites on public lands. For example, in *Lyng v. Northwest Cemetery Protective Association*, the Yurok, Karok, and Tolowa Indians fought the construction of a Forest Service road that had been proposed to run through an area of the Six Rivers National Forest in Northern California.[24] The area, known as Chimney Rock,

> "is significant as an integral and indispensible part of Indian religious conceptualization and practice." Specific sites are used for certain rituals, and "successful use of the [area] is dependent upon and facilitated by certain qualities of the physical environment, the most important of which are privacy, silence, and an undisturbed natural setting."[25]

In dissent, Justice Brennan described the tribes' relationship to the Chimney Rock area as follows:

> For respondent Indians, the most sacred of lands is the high country where, they believe, prehuman spirits moved with the coming of humans to the Earth. Because these spirits are seen as the source of religious power, or "medicine," many of the tribes' rituals and practices require frequent journeys to the area. Thus, for example, religious leaders preparing for the complex of ceremonies that underlie the Tribes' World Renewal efforts must travel to specific sites in the high country in order to attain the medicine necessary for successful renewal. Similarly, individual tribe members may seek curative powers for the healing of the sick, or personal medicine for particular

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20. *See id.* at 66.

21. *See, e.g., All Things Considered: Explaining the Underpinnings of Mormonism* (NPR radio broadcast July 5, 2007) (transcript *available at* http://www.npr.org/templates/story/story.php?storyId=11761615).

22. DELORIA, *supra* note 1, at 70.

23. *See id.*

24. Lyng v. Nw. Cemetery Protective Ass'n, 485 U.S. 439, 442 (1988). The Court is quoting from a study commissioned by the Forest Service completed in 1979. *Id.* at 442.

25. *Id.* (second alteration in original) (citations omitted).

> purposes such as good luck in singing, hunting, or love. A period of preparation generally precedes such visits, and individuals must select trails in the sacred area according to the medicine they seek and their abilities, gradually moving to increasingly more powerful sites, which are typically located at higher altitudes. Among the most powerful of sites are Chimney Rock, Doctor Rock, and Peak 8, all of which are elevated rock outcroppings.[26]

Other sacred areas that are well known due to conflicts over public lands include: Devil's Tower in Wyoming, a stark volcanic feature that is central to the religious and cultural lives of several plains tribes and also a popular rock climbing destination;[27] Cave Rock, a once-popular climbing spot that is now off-limits due in part to the religious concerns of the Washoe Tribe;[28] and Rainbow Bridge, an enormous sandstone arch that can be visited by boaters coming from Lake Powell, but which is also considered central to the ceremonies of Navajo people in the region.[29] This list is just a partial one, omitting not only many other sacred sites that have become publicly identified through land use conflicts, but also the vast number that tribes and their members keep to themselves.

Another feature of most American Indian religions is that humans are part of an animate universe and have moral relationships with all other creatures, beings, and even elements.[30] For example, the Hopi hold several springs to be sacred.[31] The springs play an integral role in the Hopi creation story and are part of ongoing ceremonies and practices.[32] Likewise, animals are sacred to many tribes and are required for the proper performance of religious ceremonies.[33] For the Northern Arapaho, Hopi, Navajo, and other plains and southwest tribes, the eagle plays a key role.[34] For each of these tribes, an entire set of practices surrounding capture, treatment, and use of the bird comprise the religious experience.[35] As this small handful of examples indicates, religious and cul-

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26. *Id.* at 461 (Brennan, J., dissenting).

27. *See* Bear Lodge Multiple Use Ass'n v. Babbit, 2 F. Supp. 2d 1448 (D. Wyo. 1998), *aff'd*, 175 F.3d 814 (10th Cir. 1999).

28. *See* Access Fund v. U.S. Dep't of Agric., 499 F.3d 1036 (9th Cir. 2007).

29. *See* Natural Arch & Bridge Soc'y v. Alston, 209 F. Supp. 2d 1207 (D. Utah 2002); Badoni v. Higginson, 455 F. Supp. 641 (D. Utah 1977).

30. *See* Rebecca Tsosie, *Tribal Environmental Policy in an Era of Self-Determination: The Role of Ethics, Economics, and Traditional Ecological Knowledge*, 21 VT. L. REV. 225, 273, 276 (1996).

31. *See* Peter Whiteley & Vernon Masayesva, *The Use and Abuse of Aquifers: Can the Hopi Indians Survive Multinational Mining?*, *in* WATER, CULTURE & POWER 13-18 (John M. Donahue & Barbara Rose Johnson eds., 1998).

32. *See* Katosha Belvin Nakai, *Water: It Always Has Been; It Is; It Will Be—A Cultural Perspective on the Valuation of Water*, 38 TEX. TECH L. REV. 1027, 1032-33 (2006).

33. DELORIA, *supra* note 1, at 89.

34. *See* Victoria Sutton, *Wind and Wisdom*, 1 ENVTL. & ENERGY L. & POL'Y J. 345, 360 (2007).

35. *See* United States v. Friday, No. 05-CR-260-D, 2006 WL 3592952, at *1 (D. Wyo. Oct. 13, 2006) (describing the religious significance of the eagle to the Northern Arapaho); United States

tural life for American Indians is inextricably bound up with a way of living in a particular place with and among its creatures and elements. Thus, despite the variety within and among American Indian tribes, Vine Deloria identified the following common features of the American Indian religious outlook:

> The Indian is confronted with a bountiful earth in which all things and experiences have a role to play. The task of the tribal religion, if such a religion can be said to have a task, is to determine the proper relationship that the people of the tribe must have with other living things and to develop the self-discipline within the tribal community so that man acts harmoniously with other creatures. The world that he experiences is dominated by the presence of power, the manifestation of life energies, the whole life-flow of a creation. Recognition that the human beings holds [sic] an important place in such a creation is tempered by the thought that they are dependent on everything in creation for their existence.[36]

This attachment to place, rooted in religious and cultural norms and traditions, is integral to the disparate effects tribes are experiencing due to global warming. It is not simply that places to which strong religious feelings are attached are at risk. Ways of life that have evolved specifically around these places are also at risk. The option of relocating is certainly as available to tribal communities as to others, but relocation has a different meaning if the cultural definition of a people is bound to a location and its unique ecological offerings. Certainly, this resonates with issues faced by other affected communities. The people who came home to New Orleans, and the people who never left, describe their attachment to a way of life, not just a spot on the map.[37] The point is not to say that the norms and practices of Native communities are like no others. But, there is a key distinction to keep in mind. For Native communities, it is not just the place that matters, but the animate world of which it is a part: the animals, plants, seasons, and rhythms that flow from centuries of knowledge about a place and all of its emanations.[38] Global warming is already affecting all of these aspects of place, and will continue to do so for some time to come.

II. EFFECTS ON NATIVE COMMUNITIES FROM GLOBAL WARMING

Scientific knowledge about the phenomenon of climate change has been accumulating for at least two decades, and reports by international bodies and others have become increasingly certain about the causes as

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v. Tawahongva, 456 F. Supp. 2d 1120, 1124 n.8 (D. Ariz. 2006) (describing the religious significance of the eagle to the Hopi).

36. DELORIA, *supra* note 1, at 88.

37. *See, e.g.*, Mike Miller, *Morning Edition: My Home Is New Orleans* (NPR radio broadcast Aug. 28, 2006) (transcript *available at* http://www.npr.org/templates/story/story.php?storyId=5705026).

38. *See* Tsosie, *supra* note 30, at 276-80.

well as the need for immediate policy responses. The Intergovernmental Panel on Climate Change (IPCC) issued its fourth set of assessment reports in 2007, and its conclusions were stark.[39] The reports, which reflect the consensus of hundreds of participating scientists who have reviewed thousands of studies on climate, concluded that "warming of the climate system is unequivocal," and further expressed "very high confidence" that human emissions of CO_2 and other heat-trapping gases since 1750 have caused the earth's surface temperature to rise.[40] During that time, CO_2—the most important of the anthropogenic greenhouse gases—increased from a pre-industrial level of roughly 280 parts per million (ppm) to 379 ppm in 2005.[41]

Unfortunately, the moment has long passed when we could think exclusively about mitigation strategies, as they are called in climate change parlance. Mitigation strategies are those aimed at reducing and eventually zeroing out global greenhouse gas emissions in order to slow, stop, and perhaps ultimately even reverse the warming trend. Scientists estimate that beyond 455 ppm of CO_2, the effects from warming will be extreme, unpredictable, and even catastrophic.[42] The pressing need to engage in serious, globally coordinated action to mitigate emissions still exists, and will continue to exist indefinitely, because even if we surpass 455 ppm, we will need to stabilize and eliminate emissions, or the climate system will be an ever-moving, increasingly volatile target, rendering adaptation measures temporary at best, futile at worst. But, as the IPCC reports indicate, the effects of warming are already being experienced and, even under the most optimistic mitigation scenarios, will continue for the foreseeable future.[43] Governments around the world are therefore already engaging in adaptation planning, which means fashioning reactions to the extant and inevitable effects of warming. These ef-

39. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS (Susan Solomon et al. eds., Cambridge Univ. Press 2007) [hereinafter IPCC: THE PHYSICAL SCIENCE BASIS]; INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY (Martin Parry et al. eds., Cambridge Univ. Press 2007) [hereinafter IPCC: IMPACTS, ADAPTATION AND VULNERABILITY].

40. IPCC: THE PHYSICAL SCIENCE BASIS, *supra* note 39, at 3, 5.

41. *Id.* at 2.

42. *See* Dan Shapley, *Global Warming "Beyond the Worst-Case Scenario,"* THE DAILY GREEN.COM, Oct. 9, 2007, http://www.thedailygreen.com/environmental-news/latest/7642; *see also* Jim Hansen, *The Threat to the Planet*, 53 THE NEW YORK REVIEW OF BOOKS 12 (2006), *available at* http://www.nybooks.com/articles/19131. Hansen states that the business-as-usual scenario, with an annual global increase in emissions of two percent such as has occurred in the last 10 years, will make it impractical to achieve the reductions necessary to stabilize temperature increases at less than two degrees Fahrenheit. *Id.* At temperature increases above this, feedback effects, including the release of methane from permafrost, could result in much more accelerated warming. *Id.* In addition, the business as usual scenario would cause the disintegration of the land-based ice sheets, ultimately resulting in an 80-foot rise in sea levels. *Id.* Others put the critical stabilization point at 500 ppm for CO_2. *See, e.g.*, Martin Hoffert, Physics Dept., N.Y. Univ., Presentation at the Natural Resources Law Ctr., Univ. of Colorado: An Energy Revolution for the 21st Century (June 8, 2006), *available at* http://www.colorado.edu/law/centers/nrlc/summerconference/2006/Hoffert.zip (copy also on file with author).

43. IPCC: THE PHYSICAL SCIENCE BASIS, *supra* note 39, at 12.

fects include rising sea levels (with predictions ranging from a few to twenty or more feet), acidification of oceans with harm to coral reefs and other species, increasing intensity and frequency of extreme weather events (such as tropical storms and heat waves), larger drought affected areas and more frequent droughts and floods, and changing patterns for pests and diseases of various sorts.[44] This is a list of likely global effects, and each region will experience different consequences. The *Native Communities and Climate Change* Report drew from various regional studies of current and future effects in order to draw some conclusions about impacts on American Indian tribes in those areas.[45]

A. Pacific Northwest: Effects on Salmon

For American Indian Tribes of the Pacific Northwest, the potential demise of wild salmon is the signature effect of climate change. Salmon are central to the religious, cultural, and economic lives of most tribes in the region, and as a result tribes negotiated treaty rights, enforceable to this day, to continue to harvest the fish.[46] While threats to wild salmon are multiple, the changing climate could be the factor that pushes the species beyond the brink. For these reasons, salmon are an appropriate lens through which to view the impacts to Northwest tribes from climate change.

1. Changing Climate in the Pacific Northwest

The Pacific Northwest has experienced a region-wide warming trend over the last 100 years.[47] Average temperatures have risen by 1.5 degrees Fahrenheit, with the 1990s being the warmest decade.[48] Average temperatures in the Puget Sound region rose at a higher rate, with a 2.3 degree Fahrenheit increase in the twentieth century, and much of that warming occurring within the last 50 years.[49] Projections for the future indicate that the warming trend will accelerate.[50] Climate models predict that average temperatures for the region will rise at the rate of 0.5 degrees Fahrenheit per decade at least through the middle of the twenty-first century, with greater increases between June and August but higher average temperatures occurring year round as well.[51]

Precipitation changes have also occurred in the region. The Pacific Northwest experienced an 11 percent average increase in annual precipitation in the twentieth century.[52] Yearly levels fluctuated significantly,

44. IPCC: IMPACTS, ADAPTATION AND VULNERABILITY, *supra* note 39, at 11-12, 14, 18.
45. *See* HANNA, *supra* note 2, at 5.
46. *Id.*
47. *Id.*
48. *Id.*
49. *Id.*
50. *Id.*
51. *Id.*
52. *Id.*

however, and the past trend is not as easy to discern as it is for the temperature record.[53] Future predictions about precipitation amounts are also less definitive, though most climate models show only little or slight change in the annual mean precipitation through the first half of the twenty-first century.[54] The more significant effect is on the hydrologic cycle. While roughly the same amount of precipitation appears likely to fall in the region, more of it will fall as rain rather than snow, and the spring runoff will occur earlier.[55] With warmer temperatures occurring all year and particularly in the summer, stream flows will be higher in the winter and lower in the spring and summer.[56] These changes in turn are likely to cause more flooding in the winter and more drought risk in the summer, when water is in greater demand.[57]

Climate change has also already resulted in changes to the marine and fresh water environment in the region. Rising sea levels are causing shore erosion, landslides, damage to coastal estuarine and salt marsh habitats, and destruction of near-shore marine plants including eelgrass and bull kelp.[58] In addition, climactic factors will change the circulation and upwelling patterns in the Puget Sound area, where freshwater inland streams mix with saltwater from the Pacific Ocean to create a unique marine environment on which aquatic species depend.[59] Changes in freshwater flow and timing, described above, will affect the circulation and stratification of these coastal waters.[60] In addition, warmer air temperatures will result in warmer freshwater and ocean temperatures.[61] Temperature increase, along with the increased volume of freshwater into the marine environment, will further affect ocean salinity.[62] Both the changing temperatures and salinity will in turn affect oxygenation levels and phytoplankton growth.[63] High levels of winter precipitation are also the likely cause of higher levels of fecal coliform in Puget Sound.[64] Finally, glacial melt will affect volume and temperatures of stream flows, and may also increase stream contamination when pollutants stored in the ice are released by melting.[65]

53. *Id.*
54. *Id.* at 5-6.
55. *Id.* at 6.
56. *Id.*
57. *Id.*
58. *Id.*
59. *Id.*
60. *Id.*
61. *Id.*
62. *Id.*
63. *Id.*
64. *Id.*
65. *Id.*

2. Effects on Salmon and Tribes

Salmon will be affected by each of the above described effects of climate change in the Pacific Northwest. As anadromous fish, salmon hatch in freshwater, migrate to the ocean to mature, and then make their way back to the freshwaters of their birthplace to spawn.[66] Because they move through various aquatic environments in the course of their lifecycle, the effects climate change will have on each of these environments will in turn affect the salmon. First, increases in freshwater temperatures pose risk to the salmon. Higher stream temperatures will affect the success and timing of egg incubation.[67] For those salmon fry that do hatch, a further risk is that stream temperatures may eventually become too high to support the young fish.[68] Rising stream and marine temperatures could also diminish the salmon food supply.[69] If ocean temperatures rise dramatically, entire salmon populations might be forced to abandon historic migration patterns and habitat ranges, seeking colder waters to the north.[70] This phenomenon may have already begun. Coho salmon, for example, have been found one thousand miles further north than their traditional habitat.[71] Similarly, other species may move into salmon habitat in search of cooler waters, creating greater risk of predation and competition for food.[72]

Changes in the hydrologic cycle will also affect the salmon. More winter precipitation and higher winter stream flows will increase the frequency and severity of flooding, scouring streambeds and potentially destroying the gravel habitat necessary for salmon spawning.[73] Flooding will increase the number of landslides, causing siltification of stream beds which could smother salmon eggs.[74] Higher and earlier winter stream flows may also push the young salmon along their ocean-ward journey earlier than usual, forcing them into the saltwater environment before food supplies are available.[75] Finally, the lower summer flows will make it more difficult for salmon to migrate and increase already tight competition both for habitat and food sources.[76]

Certainly, climate change does not pose the first or only threat to salmon survival. Many salmon species are already on the brink of extinction due to logging, dams, over-fishing, and the range of other effects on water quality and quantity that have been visited on the region during

66. *Id.* at 7.
67. *Id.*
68. *Id.*
69. *Id.*
70. *Id.*
71. *Id.*
72. *Id.*
73. *Id.*
74. *Id.*
75. *Id.*
76. *Id.*

the last 200 years.[77] Yet climate change could be the over-riding factor that renders all of the other restoration efforts futile. Fish ladders, stream-bed restoration, and restrictions on over-fishing could all be for naught if the changes described above cause the species to abandon the region entirely. For the American Indian tribes of the Pacific Northwest, this would be a cultural and economic disaster. For thousands of years, salmon have provided the basis of a way of life for these tribes.[78] Historically, salmon poured out of the Northwest streams in numbers that today defy imagination. In the Columbia River basin alone, it is estimated that 16 million salmon and steelhead were produced annually.[79] The salmon's regular migratory patterns allowed the tribes to rely on them as a year-round food source, and tribal fishing and storage techniques created the basis for extensive trade networks.[80] The salmon's centrality to tribal life is reflected in tribal custom, artwork, legend, and ceremonial life.[81]

The salmon's significance to American Indian tribes of the region is also reflected in the treaties that the tribes entered into, ceding vast tracts of their aboriginal homelands but carefully retaining the right to fish.[82] From 1854 to 1855, Isaac Stevens, governor of the Washington Territory, negotiated treaties with tribes throughout what are now Washington, Oregon, and Idaho.[83] In recognition of the centrality of salmon to these otherwise diverse Indian nations, Governor Stevens included virtually identical language reserving the tribes' right to fish into each treaty.[84] The following language from the Treaty with the Tribes of Middle Oregon is representative:

> [T]he exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians; and at all other usual and accustomed stations, in common with citizens of the United States, and of erecting suitable houses for curing the same; also the privilege of hunting, gathering roots and berries, and pasturing their stock on unclaimed lands, in common with citizens, is secured to them.[85]

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77. *See* CHARLES F. WILKINSON, CROSSING THE NEXT MERIDIAN 199-203 (Island Press 1992).

78. HANNA, *supra* note 2, at 8.

79. *Id.*

80. *Id.*

81. *Id.*

82. *See* WILKINSON, *supra* note 77, at 187.

83. *Id.*

84. *Id.*

85. Treaty with the Tribes of Middle Oregon art. 1, June 25, 1855, 12 Stat. 963. The other Stevens Treaties are: Treaty of Medicine Creek, Dec. 26, 1854, 10 Stat. 1132 (treaty between the United States and the following tribes: Nisqually, Puyallup, and Squaxin Island); Treaty of Point Elliott, Jan. 22, 1855, 12 Stat. 927 (treaty between the United States and the Dwamish, Suquamish, and Other Allied and Subordinate Tribes of Indians in Washington Territory); Treaty of Olympia, Jan. 25, 1856, 12 Stat. 971 (treaty between the United States and the Qui-nai-elt and Quil-leh-ute

Litigation beginning in the late 1960s established that these treaty rights had survived the passage of time. Tribes and American Indian individuals throughout the Northwest sued to require the states to regulate the fisheries to ensure that a "fair and equitable" share of anadromous fish were available to the tribes. In *United States v. Washington*,[86] the Federal District Court for the District of Washington defined the "fair and equitable" tribal share to be one-half of all salmon and steelhead not needed for spawning.[87] The Supreme Court affirmed this holding, but elaborated that "one half" of the runs was a maximum, not a minimum, and that tribes would only be entitled to the amount required to provide them with a moderate livelihood.[88] In the second phase of the *Washington* litigation, the district court addressed the states' obligations with regard to environmental quality and salmon survival.[89] The court found that the tribes had an implied right to protection of the salmon habitat, but that this was not absolute, and the state did not have affirmative duties to adopt new measures to protect the salmon, but only to exercise existing regulatory powers so as not to harm the habitat.[90] In addition to these landmark treaty cases, tribes throughout the region have litigated and sometimes settled individual cases involving water and other reserved rights affecting salmon runs.[91] In the wake of the litigation, an elaborate and effective regulatory structure has emerged. The Northwest Indian Fisheries Commission and the Columbia River Inter-Tribal Fish Commission monitor the ecological health of the streams in their respective regions and work cooperatively with state and federal agencies to effectuate tribal treaty rights.[92]

Climate change thus threatens to extinguish what tribes have fought for centuries to preserve. The backdrop of legal rights, including an implied though not absolute right to preserve the salmon's habitat,[93] create the likelihood of further litigation as the situation becomes more dire.

Indians); Treaty of Neah Bay, Jan. 31, 1855, 12 Stat. 939 (treaty between the United States of America and the Makah Tribe of Indians); Treaty of Point no Point, Jan. 26, 1855, 12 Stat. 933 (treaty Between the United States of America and the S'Klallams Indians); Treaty between the United States of America and the Nez Perce Indians, June 11, 1855, 12 Stat. 957; Treaty between the United States and the Walla-Walla, Cayuses, and Umatilla Tribes and Bands of Indians in Washington and Oregon Territories, June 9, 1855, 12 Stat. 945; Treaty between the United States and the Yakama Nation of Indians, June 9, 1855, 12 Stat. 951.

86. 384 F. Supp. 312 (W.D. Wash. 1974).

87. *Id.* at 343.

88. Washington v. Wash. State Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658, 686-87 (1979).

89. United States v. Washington, 506 F. Supp. 187, 190-91 (W.D. Wash. 1980).

90. *See id.* at 206-08.

91. *See, e.g.*, IDAHO DEP'T. OF WATER RES., THE NEZ PERCE WATER RIGHTS SETTLEMENT (May 15, 2004), *available at* http://www.idwr.idaho.gov/nezperce/index.htm.

92. *See* Northwest Indian Fisheries Commission, Overview of the NWIFC, http://www.nwifc.org/aboutus/index.asp (last visited Mar. 27, 2008) (providing an overview of the NWIFC); Columbia River Inter-Tribal Fish Commission, What Is CRITFC (2008), http://www.critfc.org/text/work.html (providing an overview of the CRITFC) (last visited Mar. 27, 2008).

93. *See* United States v. Washington, 506 F. Supp. at 190-191.

And while tribes have been able to adapt to changing circumstances by diversifying their economies, salmon remain indispensable to tribal culture and identity. Billy Frank, a Nisqually tribal member and leader who has led the battles over the Northwest fisheries, has said that "fishing defines the tribes as a people."[94] Tribal leaders throughout the region express the same sentiment. Chairman Antone Minthorn of the Umatilla Nation provided the following poignant testimony in congressional hearings about the collapse of the salmon runs: "It is almost impossible to describe in words the pain and suffering this has caused my people. We have been fisherman for thousands of years. It is our life."[95] And it is that life that, after all of the other legal, administrative, and political efforts, climate change threatens to extinguish.

B. Alaska: A Melting Landscape

The warming effects from greenhouse gas emissions are most evident at the poles of the earth, and in particular the North Pole.[96] As a result, Alaska has already experienced significant changes due to global warming, and scientists predict that the region will continue to become warmer and wetter throughout this century.[97] There are eleven distinct groups of Alaska Natives who are divided into five groups based on geographic proximity or cultural affinity: (1) the Athabascan in the East and interior; (2) the Yup'ik and Cup'ik in the West; (3) the Inupiaq and St. Lawrence Island Yupik of the North and Northwest; (4) the Aleut and Alutiiq of South Central Alaska and the Aleutian islands; (5) the Eyal, Tlingit, Haida and Tsimshian of the Southeastern archipelago.[98] Climate change is already affecting all inhabitants of Alaska, but could have particularly damaging effects on Alaska natives whose economic, social, cultural, and spiritual lives are bound up with the area's unique ecology.

1. Changing Climate in Alaska

Winter temperatures in the Alaska region have risen by six to eight degrees Fahrenheit over the last 50 years.[99] Under even a moderate greenhouse gas emissions scenario, average annual inland temperatures are predicted to rise by another six to 10 degrees Fahrenheit, and tem-

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94. Catherine A. O'Neill, *Risk Avoidance, Cultural Discrimination, and Environmental Justice for Indigenous Peoples*, 30 ECOLOGY L.Q. 1, 36 (2003).

95. Mary Christina Wood, *EPA's Protection of Tribal Harvests: Braiding the Agency's Mission*, 34 ECOLOGY L.Q. 175, 188 (2007) (quoting *Water Spreading: Hearing on Water Use Practices on Bureau of Reclamation Projects Before the H. Comm. on Natural Res., Subcomm. on Oversight & Investigations,* 103d Cong. (1994) (statement of Antone Minthorn, Chairman, Confederated Tribes of Umatilla Indian Reservation)).

96. *See* Gordon McBean et al., *Arctic Climate: Past and Present, in* ARCTIC CLIMATE IMPACT ASSESSMENT 21, 22-23 (Carolyn Symon et al. eds., Cambridge Univ. Press 2005), *available at* http://www.acia.uaf.edu/pages/scientific.html (quoting the 2001 reports of the Intergovernmental Panel on Climate Change).

97. *See id.* at 54.

98. HANNA, *supra* note 2, at 10.

99. *See id.*

peratures over the ocean will rise by another 14 degrees Fahrenheit.[100] Due to the acute warming, over the last 30 years, the average annual sea ice has decreased by roughly 8 percent, with even sharper than expected decreases occurring within the last year.[101] Other effects flowing from the rising temperatures include changes in vegetation, increases in forest fires and insect infestation, and severe coastal erosion.[102] The erosion is a result of the combined effects of rising sea levels, decreasing sea ice, and melting permafrost.[103] The first two effects combine to allow higher waves to reach the shoreline, and the third results in unstable soil that is more susceptible to being washed away.[104]

The changing climate in Alaska has already affected wildlife in the region. The plight of the polar bears, caused by the dramatic decline in sea ice as well as the higher temperatures, is well known.[105] But other species, including seals and sea lions, will have equal difficulty as the ice continues to recede. Inland, the changing vegetation will affect many bird species dependent on the flora of the tundra for nesting and breeding grounds. Some bird species, including several endangered sea birds, could lose as much as 50 percent of their breeding grounds within the century.[106] Caribou and reindeer might also decline as the tundra ecology changes and the vegetation these species rely on either disappears or moves northward.

The melting permafrost has also already caused disruption to humans. Ice highways over the tundra are thawing, resulting in transportation difficulties that will require significant reengineering to address.[107] Oil exploration has been cut in half due to the instability of the soil and consequent risk of environmental harm.[108] Future health effects could include the spread of West Nile virus and other infectious diseases.[109] The one potential benefit to humans that has been identified is that an absence of sea ice could prolong the shipping seasons as well as open new routes across the top of the world.[110]

2. Alaska Natives in a Melting World

The dramatic effects of warming have touched almost every aspect of life for Native Alaskans. A petition filed by Sheila Watt-Cloutier, a member of the Inuit Circumpolar Conference, before the Inter-American

100. *Id.*
101. *See id.* at 3, 10.
102. *Id.* at 10.
103. *Id.*
104. *See id.*
105. *See id.*; *see also* John M. Broder & Andrew C. Revkin, *Warming May Wipe Out Most Polar Bears, Study Says*, N.Y. TIMES, Sept. 8, 2007, at A11.
106. HANNA, *supra* note 2, at 10.
107. *See id.*
108. *Id.* at 10-11.
109. *Id.* at 11.
110. *See id.*

Commission on Human Rights alleges that the United States has violated various rights and norms of international law by contributing to global warming.[111] The Inuit Circumpolar Conference is comprised of all Inuit of the polar region, including those in Alaska.[112] While the territory is broader than that within the jurisdiction of the United States, the allegations in the petition aptly summarize the pervasive nature of global warming's impacts on Alaska's indigenous peoples:

> Inuit culture has developed over thousands of years in relationship with, and in response to, the physical environment of the Arctic. The Inuit have developed an intimate relationship with their surroundings, using their understanding of the arctic environment to develop a culture, including tools, techniques and knowledge, that has enabled them to subsist and thrive on the scarce resources available.[113]

That intimate knowledge is at risk, threatening the ability of Alaska Natives to build vibrant human communities. For example, elders have traditionally passed on centuries' worth of accumulated wisdom about how to read ice, snow, and other environmental conditions.[114] That wisdom is proving empty in a world of changing weather. Not only does the inability to read the weather make travel and hunting more dangerous, it also undermines the ability of the elder generations to teach the younger generations.[115] Climate change thus disrupts both the material practices that enable survival in harsh conditions and the cultural continuity that perpetuates those practices.

Due to climate change, Alaska Native communities are facing a cultural loss as profound as that suffered by the plains tribes when they were confined to reservations and forced to abandon the practices that gave their lives meaning.[116] As Professor Jonathan Lear describes in his eloquent book on the Crow leader Chief Plenty Coup, when the Crow Tribe was confined to a fraction of its former territory, and therefore unable to engage in the rituals and practices that gave meaning to being Crow, they suffered a form of cultural death more profound than what could have been achieved through criminalization of their spiritual practices:

> To make the point, allow me to speak in the first person as an imaginary Crow subject: Not only can I no longer plant a coup-stick, but nothing could count as my intending to do so. As it turns out, only in

111. *See* PETITION TO THE INTER AMERICAN COMMISSION ON HUMAN RIGHTS SEEKING RELIEF FROM VIOLATION RESULTING FROM GLOBAL WARMING CAUSED BY ACTS AND OMISSIONS OF THE UNITED STATES 1 (2005), *available at* http://www.earthjustice.org/library/legal_docs/petition-to-the-inter-american-commission-on-human-rights-on-behalf-of-the-inuit-circumpolar-conference.pdf [hereinafter INUIT PETITION].

112. *See id.* at 1, 9.

113. *Id.* at 35.

114. *Id.* at 78.

115. *Id.*

116. *See id.*

> the context of vibrant tribal life can I have any of the mental states that are salient and important to me. The situation is even worse: these are the mental states that help to constitute me as a Crow subject. Insofar as I am a Crow subject there is nothing left for me to do; and there is nothing left for me to deliberate about, intend, or plan for. Insofar as I am a Crow subject, *I* have ceased to be.[117]

So too, many Native Alaskan communities are looking at a future where they, in this profound cultural sense, may cease to be.

Some of the effects of warming in the region are even more concrete. Rising sea levels, melting sea ice, and thawing permafrost are causing coastal erosion that is destroying some Native villages.[118] The General Accounting Office found that more than 86 percent of the 216 Alaska Native villages are already subject to flooding and erosion, and that this perennial problem is likely to become worse due to warming temperatures.[119] The villages of Kivalina, Koyukuk, Newtok and Shishmaref are severely affected and will have to relocate, which is not only painful to community members, but also very expensive.[120] Relocating Kivalina, for example, has been estimated to cost $1 million per villager.[121]

The legal status and rights of Alaska Natives differ from those of American Indian tribes in the lower 48 states. Yet, similar to the tribes of the Pacific Northwest, the Southwest, and Florida, Alaska natives do have unique legal claims that are implicated by the effects from climate change. The Alaska Native Claims Settlement Act (ANCSA),[122] enacted in 1971, extinguished all claims to aboriginal title and associated hunting and fishing rights in exchange for Alaska Natives' selection of ownership of approximately 45 million acres of land, $462.5 million in congressional appropriations, and $500 million in expected state revenues from oil royalties.[123] ANCSA also provided for the land and money to be distributed to Native local and regional corporations, rather than directly to existing tribal governments.[124] Despite ANCSA's obvious assimilationist bent, Congress intended for Native Alaskans' traditional subsistence activities to be protected by the Department of the Interior.[125] When it became clear that subsistence rights were being insufficiently protected

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117. *See* JONATHAN LEAR, RADICAL HOPE: ETHICS IN THE FACE OF CULTURAL DEVASTATION 49-50 (Harvard Univ. Press 2006) (emphasis in original).

118. U.S. GEN. ACCOUNTING OFFICE, PUBL'N NO. 04-142, ALASKA NATIVE VILLAGES: MOST ARE AFFECTED BY FLOODING AND EROSION, BUT FEW QUALIFY FOR FEDERAL ASSISTANCE 7-8 (2003).

119. *See id.* at 2-3.

120. *See id.* at 4.

121. *See id.*

122. 43 U.S.C.A. § 1601 (West 2008).

123. *See* 43 U.S.C.A. §§ 1603, 1605-06, 1608 (West 2008).

124. 43 U.S.C.A. § 1628 (West 2008).

125. *See* HANNA, *supra* note 2, at 14.

after ANCSA, Congress passed the Alaska National Interest Lands Conservation Act (ANILCA)[126] which establishes priorities for subsistence activities based on rural residency rather than Native status.[127] Nonetheless, the statute provides a legal basis for Alaska Natives, as well as their non-Native neighbors engaging in subsistence lifestyles, to continue to use federal lands to engage in subsistence activities.[128] ANILCA's regulatory structure allows for participation by Native Alaskans in the formulation of subsistence policies.[129] Several other federal statutes reinforce Alaska Native subsistence rights by preempting state regulation of certain activities such as game hunting, reindeer herding, and whaling.[130] While these rights arguably have less bite than treaty rights, they nonetheless contribute to the justice claims that Alaska Natives may assert in response to climate change, and at a minimum should put lawmakers on notice that serious legal issues will be on the horizon even if we act swiftly to mitigate global warming. Alaska is already melting, and Alaska Natives are on the forefront of climate activism as a result.[131]

C. Southwest: Water Scarcity

There are more than 70 federally recognized Indian tribes in the Southwest, all of which rely on the region's scarce water resources to survive.[132] The Southwest is the heart of the arid region, receiving less than 10 inches of rainfall on average each year.[133] Tribes, like the Hopi, that have lived in the Southwest for millennia have cultural and religious ceremonies that revolve around maintaining the health and wellbeing of their sacred springs.[134]

1. Climate Change in the Southwest

Not surprisingly, the signature effect of climate change in this region will be water scarcity.[135] Model projections range, but all predict declining precipitation as temperatures increase.[136] One study projected

126. 16 U.S.C.A. § 3101 (West 2008).
127. 16 U.S.C.A. § 3111 (West 2008).
128. *See* 16 U.S.C.A. §§ 3111, 3115 (West 2008).
129. In furtherance of ANILCA's mandate, the Secretaries of Agriculture and the Interior established the Federal Subsistence Board to oversee management of subsistence activities on federal lands and waters of Alaska. *Id.* §§ 3112, 3115. In 1993, the Board established 10 regional advisory councils, and Alaska Natives are well represented in these councils. *See generally* FRANK NORRIS, U.S. DEP'T INTERIOR, ALASKA SUBSISTENCE: A NATIONAL PARK SERVICE MANAGEMENT HISTORY ch.7 (2002).
130. *See* Endangered Species Act, 16 U.S.C.A. § 1531 (West 2008); Reindeer Industry Act of 1937, 25 U.S.C.A. § 500 (West 2008); Marine Mammal Protection Act, 16 U.S.C.A. § 1361 (West 2008).
131. *See, e.g.*, INUIT PETITION, *supra* note 111, at 10-11.
132. *See* HANNA, *supra* note 2, at 18.
133. U.S.G.S., EFFECTS OF CLIMATIC VARIABILITY AND LAND USE ON AMERICAN DRY LANDS 1 (2004), *available at* http://esp.cr.usgs.gov/info/sw/maps.html.
134. *See* Whiteley & Masayesva, *supra* note 31, at 10.
135. HANNA, *supra* note 2, at 19.
136. *See* IPCC: THE PHYSICAL SCIENCE BASIS, *supra* note 39, at 16 fig. SPM7.

that a 2 degrees Celsius temperature rise could result in a 20 percent reduction in stream flows to the Colorado River basin.[137] Another predicted a decrease ranging between seven to 20 percent.[138] All studies predict increasing precipitation falling as rain rather than snow, and earlier and shorter spring run-offs.[139] Even without certainty as to decreasing amounts of precipitation, these changes are enough to result in less water for the entire region.

2. Effects on Southwest Tribal Water Rights

Just as the Pacific Northwest tribes have powerful legal rights to fish, Southwest tribes have powerful rights to water, at least on paper. By virtue of the *Winters* doctrine, most tribes have a priority water right that dates back to the creation of their reservations.[140] In the West, water rights are typically determined by the doctrine of prior appropriation, which grants superior rights to the user who is first in time to divert the water.[141] *Winters* reserved rights are superior to most prior appropriation claims because of the pre-settlement dates of many treaties.[142] Thus, legally, tribes have rights to water that threaten to up-end existing patterns of diversion and use. In the real world, however, tribes' paper rights have often not stood up to existing diversions.[143]

Some tribes have entered into settlements regarding their water rights, but many others have not. As of 2004, Congress had approved of 18 such settlements with Indian tribes.[144] Whether tribal water rights are settled, adjudicated, or as yet unquantified, global warming's effects on water will only heighten the tension that exists with regard to access to the West's most precious and scarce resource. For all Southwest tribes—and the Hopi can perhaps stand in here as shorthand—the consequences are more than just economic. They are religious and cultural.[145] They are about a way of life and attachment to land and its creatures that has existed for millennia, adapting in many ways to changing circumstances, but not ready or willing to adapt to life without their sacred waters. If historical practices are any guide, tribal legal rights and the moral claims that back them up will be vulnerable to the greater political power that

137. HANNA, *supra* note 2, at 19.
138. *Id.*
139. *See id.* at 6.
140. *See* Winters v. United States, 207 U.S. 564, 564 (1908) (holding that the Fort Belknap Tribe's treaty impliedly reserved water rights for the reservation notwithstanding the absence of express language to that effect).
141. HANNA, *supra* note 2, at 22.
142. *See id.* at 23.
143. *See* WILKINSON, *supra* note 77, at 219-31 (describing effects of pre-existing diversions and massive reclamation projects on Jicarilla Apache and Navajo claims to water).
144. THE HARVARD PROJECT ON AMERICAN INDIAN ECONOMIC DEVELOPMENT, THE STATE OF NATIVE NATIONS: CONDITIONS UNDER U.S. POLICIES OF SELF DETERMINATION 170 (2008) [hereinafter THE STATE OF NATIVE NATIONS].
145. *See* Whiteley & Masayesva, *supra* note 134, at 15 (describing Hopi ceremonies and beliefs surrounding water and their sacred springs).

rests with competing water users in the region, including large and growing cities, metropolitan districts, and agricultural interests.[146]

D. Florida: Rising Sea Levels

Florida's two tribes, the Seminole and the Miccosukee, are descended from tribes throughout the region whose members migrated south to escape conflict with other tribes as well as European and American persecution.[147] Members from the Creek, Hitchiti, Apalachee, Mikisuki, Yamassee, Yuchi, Tequesta, Apalachicola, Choctaw, and Oconee joined together, along with some escaped slaves, to form the two groups that now are Florida's federally recognized Indian nations.[148] Florida will be seriously affected by climate change, predominately due to rising sea levels and rising temperatures, as well as increased frequency and severity of extreme weather events.[149]

1. Climate Change in Florida

The most dramatic impact of climate change for Florida tribes stems from the predicted rise in sea levels in that region.[150] Over the next century, a rise of anywhere from eight to 30 inches is possible, which could result in an advance of up to several hundred feet on Florida's gradually sloped shoreline.[151] Florida has approximately 4,500 square miles of land within five feet of sea level.[152] Much of this low elevation consists of the Everglades in the southern tip of Florida.[153] Rising temperatures will also have profound effects in the region. The heat index is predicted to rise by as much as eight to 15 degrees Fahrenheit over the next 100 years, affecting public health, agriculture, and ecosystems throughout the state.[154]

2. Effects on Florida Tribes: Inundation of Reservation Lands

The Seminole and Miccosukee have reservation lands in and around the Everglades, and they use its mangrove forests, cypress domes, and saw grass prairies for hunting, gathering, and other traditional subsistence activities.[155] The rising sea levels, changing weather patterns, elevated temperatures, and saltwater intrusion all could have devastating

146. *See* WILKINSON, *supra* note 77, at 219-26; *see also* MARC REISNER, CADILLAC DESERT 255-305 (Penguin Books 1986) (recounting the machinations to get water to Arizona and California and noting the tribes' powerful paper rights).

147. HANNA, *supra* note 2, at 24.

148. *Id.*

149. *Id.*

150. *Id.* at 26.

151. *Id.* at 25.

152. ENVTL. PROT. AGENCY, PUBL'N No. 430-F-02-007, SAVING FLORIDA'S VANISHING SHORES 5 (2002) *available at* http://www.epa.gov/climatechange/effects/coastal/saving_FL.pdf.

153. *Id.*

154. *See* HANNA, *supra* note 2, at 25.

155. *Id.* at 26.

effects on this region and the plants and animals on which the tribes rely to support their traditional practices. Flooding could result in the direct loss of tribal lands, significant portions of which are in the most vulnerable areas. For example, the Seminole Tribe's Hollywood reservation is located in the coastal area around Ft. Lauderdale and their Big Cypress reservation is in a low-lying wetland southeast of Ft. Myers.[156] Similarly, the Miccosukee Tribe's lands are near Miami and the Everglades.[157] Tribal land loss threatens not just tribal homes, but also the ability to engage in cultural and religious practices. Both the Seminole and the Miccosukee have a long history of subsistence activities, including hunting, fishing, and growing crops in the Everglades.[158] Traditional ceremonies, such as the annual Green Corn Dance that brings tribal clans together to celebrate the harvest, socialize, and settle grievances, are at risk if climate change disrupts or eviscerates the possibility of a harvest.[159]

Climate change will also affect tribal economies in ways similar to the impacts on the rest of Florida. The Seminole have profitable citrus and sugar cane operations, and rising temperatures, increasing storms, and changing water tables will make these more volatile and less profitable.[160] Tourism, likewise, is a source of income and economic development for both tribes, and is linked to the tribes' gaming revenues.[161] Both of these non-agricultural sources of income are also vulnerable due to Florida's poor climate outlook.[162]

Like the tribes of the Pacific Northwest and the Southwest, the Seminole and Miccosukee have legal rights both to their land and to engage in their traditional hunting and other practices. The Seminole Tribe settled a land claims dispute with Florida and the South Florida Water Management District in 1987, securing rights to continue traditional ceremonial and subsistence practices.[163] The Seminole also retained rights in Everglades National Park and Big Cypress that were previously recognized.[164] The Miccosukee Reserved Area Act reserved a section of the Everglades for the Miccosukee, and recognized rights to use lands and waters in the park for fishing, boating, and cultural and religious practices.[165] Like the Seminole, the Miccosukee have customary use

156. *Id.*
157. *Id.*
158. *Id.*
159. *Id.*
160. *Id.* at 26-27.
161. *Id.* at 27.
162. *Id.*
163. *Id.*
164. *Id.*
165. *Id.*

rights to land in the Big Cypress area.[166] All of these rights, like those of the other tribes discussed, may become meaningless in a warming world.

E. Proposals to Meet Our Unique Obligations to American Indian Tribes

The *Native Communities and Climate Change* Report (Report) makes several recommendations to Congress regarding measures to address the effects of climate change on American Indian tribes.[167] The first is an important procedural one regarding the necessity of tribal input and participation. The Report suggests that Congress should hold congressional hearings to gather information from tribes themselves before enacting any provisions into legislation.[168] Further, as Congress expands the administrative capacity for responding to climate change, it should establish ongoing channels of communication with tribes and their representatives so that tribal nations can be involved in the process of formulating climate policy.[169] These consultation measures are essential to creating climate change solutions that will be effective for tribes. The history of federal relations with tribes indicates that policies with the harshest effects on American Indians were those crafted without their consultation and consent.[170]

Second, the Report suggests that Congress should include an adequate revenue raising mechanism in climate change legislation to respond to tribes' costly adaptation needs, as well as to fund tribal mitigation programs.[171] To date, Congress has not passed any serious carbon emissions reduction legislation. But several bills have been introduced, most of which propose a cap-and-trade scheme to limit emissions.[172] Only one bill has proposed a carbon tax, which is the preferred approach of most economists[173] and may also be the best alternative for meeting our obligations to American Indian tribes. Carbon taxes, if calibrated accurately, are the most efficient route to achieve emissions reductions.[174] They also have the benefit of a revenue stream that would exist as long as the tax takes to achieve the eventual desired result of zero-

166. *Id.*
167. *Id.* at 30-31.
168. *Id.* at 30.
169. *Id.*
170. *See* THE STATE OF NATIVE NATIONS, *supra* note 144, at 3-5 (recounting briefly the history of United States-American Indian relations). This history reveals that the most damaging policies, such as allotment and termination, were crafted and implemented without meaningful tribal consultation and that even well-intentioned efforts faltered due to excessive control by the federal government. *See id.* at 4 (describing the Indian Reorganization Act policies, which gave inordinate control to the Secretary of the Interior).
171. HANNA, *supra* note 2, at 30-31.
172. *See* Victor B. Flatt, *Taking the Legislative Temperature: Which Federal Climate Change Legislative Proposal Is Best?*, 102 NW. U. L. REV. COLLOQUY 123, 135 (2007) (analyzing climate change bills introduced in the 110th Congress), *available at* http://www.law.northwestern.edu/lawreview/colloquy/2007/32/.
173. *Id.* at 135, 138.
174. *See id.* at 138-39; *see also* CARBON TAX CENTER, INTRODUCTION (2007), http://www.carbontax.org/introduction/#cap-and-trade (last visited Mar. 27, 2008).

emissions. While cap-and-trade systems can also generate revenue if the initial allowances are auctioned to emitters, as proposed by some of the congressional bills, there are greater risks of cheating, rent-seeking and other non-compliant behaviors under cap-and-trade regimes.[175] The Report does not take a position on a cap-and-trade regime versus a carbon tax,[176] but it would behoove legislators to take seriously the benefits of a carbon tax given the inevitable need for government funding to address our legal and moral obligations to tribes.

Third, the Report recommends that Congress invest in alternative energy development on tribal lands.[177] Tribes have significant capacity for wind, solar, and other forms of renewable energy.[178] Some have already begun to develop their renewable energy resources with assistance from existing federal programs.[179] As this sector of the economy becomes more important and profitable, the federal government should make sure that tribes are not left out of any emerging incentive structure.

As the Report and its suggestions make plain, to address legal and moral obligations to tribes, Congress will have to provide for sufficient funding for the unique adaptation challenges tribes face. Congress should also, however, adopt a national mitigation strategy that is effective, that provides incentives to develop alternative energy and technology, and that includes a revenue stream to address adaptation inequities. The reason for stressing the need for effective mitigation is that if the United States (and therefore the world) fails to reverse global warming, much of what matters to tribes spiritually and culturally will be lost, as discussed above in Parts I and II. Without mitigation, not only will adaptation be a never-ending endeavor, it may eventually be an unintentional exercise in tribal termination, if what it means to be a tribe is to retain a distinctive worldview and culture. This leads us, however, to the difficult subject of whether we have the ethical framework necessary to adopt effective mitigation strategies.

III. SAVING THE WORLD TO SAVE NATIVE COMMUNITIES, OR VICE VERSA?

The disproportion between American Indian contributions to global warming and the negative effects on tribal communities is part of a larger global story of climate injustice. The developed countries, including most significantly the United States, are responsible for two-thirds or

175. *See* Tom Redburn, *The Real Climate Debate: To Cap or to Tax?*, N.Y. TIMES ONLINE, Nov. 2, 2007, http://www.nytimes.com/2007/11/02/us/politics/04web-redburn.html.

176. *See* HANNA, *supra* note 2, at 30-31.

177. *Id.* at 31.

178. *See* THE STATE OF NATIVE NATIONS, *supra* note 144, at 161-62.

179. *See, e.g.*, NATIVEENERGY, OUR PROJECTS, http://www.nativeenergy.com/pages/our_projects/14.php (last visited Mar. 27, 2008) (providing a list of tribal wind and other renewable energy projects).

more of historical greenhouse gas emissions.[180] Yet underdeveloped and developing nations will experience more serious impacts.[181] There are interrelated reasons for this. Many developing nations are located at latitudes that are more vulnerable to changes in surface temperature and its consequent effects on soil, water availability, and local weather.[182] In addition, developing nations, by definition, are poorer than developed nations, and have fewer economic resources to devote to adaptation measures. Further, many economies within developing nations are centered on local natural resources, the alteration or destruction of which will therefore have dramatic economic and cultural effects.[183] For Africa, for example, the IPCC Fourth Assessment Report expressed high confidence that, among other effects:

> by 2020, between 75 and 250 million people will be exposed to an increase of water stress due to climate change;
>
> local food supplies will be negatively affected by decreasing fisheries in large lakes due to rising temperatures;
>
> agricultural production, including access to food, will be severely compromised by climate variability and change.[184]

As the IPCC Fourth Assessment Report dryly concludes, "Africa is one of the most vulnerable continents to climate variability and change because of multiple stresses and low adaptive capacity."[185] While the details vary greatly, the IPCC and other sources report a similarly disparate vulnerability for virtually all underdeveloped and developing regions.[186]

The developed nations, by contrast, have not only benefited economically from their historical greenhouse gas emissions, they have also begun to spend some of that wealth on adaptation programs. For example, desalination projects are in the planning stages for arid regions in the United States and Australia.[187] The Netherlands has begun to modify its infrastructure to prepare for rising sea levels, including constructing amphibious housing and planning for entire floating cities.[188] California and other western American states are well into planning processes for how

180. *See* Stephen M. Gardiner, *Ethics and Global Climate Change*, 114 ETHICS 555, 579 n.75 (2004). Exact figures vary somewhat depending on the method of analysis.

181. *See, e.g.*, IPCC: IMPACTS, ADAPTATION AND VULNERABILITY, *supra* note 39, at 412.

182. *See, e.g., id.* at 394.

183. *See, e.g., id.* at 413-15.

184. *Id.* at 13.

185. *Id.* at 8.

186. *See id.* at 12-15.

187. *See Applause, at Last, for Desalination Plant*, TAMPA TRIB., Feb. 22, 2007, at A16; *Sydney Desalination Plant to Double in Size*, AUSTL. BROAD. CORP. NEWS, June 25, 2007, http://www.abc.net.au/news/stories/2007/06/25/1961044.htm.

188. Matt Bradley, *Dutch Design Lets Homes Float on the Floodwaters*, CHRISTIAN SCI. MONITOR, Oct. 26, 2005, at A13.

to adapt their water storage facilities.[189] So while global warming ultimately will be democratic, in that no one anywhere will be beyond its effects, wealthy nations will be less vulnerable initially, and will be better able to manage the consequences.

Complicating the equitable issues even further, poor people, regardless of where they live, will suffer more from the effects of global warming. As Dale Jamieson has put it, "this pattern of the poor suffering most from extreme climactic events has been documented as far back as the 'little ice age' that occurred in Europe from 1300 to 1850."[190] Close to home, Hurricane Katrina highlighted the disproportionate effects of extreme weather on poor and minority populations, and the lessons from Katrina are relevant regardless of whether that particular storm was intensified or caused by climate change, given the IPCC's predictions regarding increases in extreme weather, including heat waves, droughts, heavy precipitation, and tropical storms.[191]

Global warming thus presents questions about obligations that the global community owes to vulnerable populations, other species, and future generations. There are also issues concerning whether developed nations, which have benefited from unregulated emissions, should have a higher obligation to reduce global emissions today and in the future. And for some countries, in particular the United States, there is a question of whether that obligation should be further heightened by obdurate behavior since the late 1980s, which may well have cost the entire world several precious decades during which un-recoupable progress might have been made.

Despite these various compelling reasons to see global warming in moral and ethical terms, many do not perceive it as a moral issue. According to Dale Jamieson, "[a] paradigm moral problem is one in which an individual acting intentionally harms another individual; both the individuals and the harm are identifiable; and the individuals and the harm are closely related in time and space."[192] The spatial and temporal dispersion that defines global warming makes these identifications and connections particularly difficult to make.[193]

The difficulties are exacerbated by the fact that the behavior constituting the harm was (and for many still is) simply living a normal life in a wealthy, developed country. Consider my very own maternal grand-

189. *See, e.g.*, STATE OF CALIFORNIA OFFICE OF THE GOVERNOR, GOVERNOR CALLS FOR AGREEMENT ON COMPREHENSIVE WATER INFRASTRUCTURE PLAN (Nov. 13, 2007), http://gov.ca.gov/issue/water-supply.

190. Dale Jamieson, *Adaptation, Mitigation, and Justice*, 5 ADVANCES IN ECON. OF ENVTL. RESOURCES 217, 227 (2005).

191. *See* IPCC: IMPACTS, ADAPTATION AND VULNERABILITY, *supra* note 39, at 15.

192. Dale Jamieson, The Moral and Political Challenges of Climate Change 1 (Mar. 14, 2008) (unpublished manuscript) (on file with author).

193. *See id.* at 1-3.

parents. They drove two big Buicks for many years, lived in an apartment heated and cooled by fossil fuels, and, in their later years, flew all over the globe to travel. While I am not certain about this, it seems likely that my grandmother never once took public transportation to get anywhere in her hometown of Columbus, Ohio. By living this (from their perspective, hard-earned, up from the shtetl, American dream of a) life, they, along with similarly situated U.S. residents, have contributed to more than one third of the global emissions that have put us in this climactic bind. Yet when they drove to the kosher butcher or boarded the plane to fly to Santiago, Chile, they had no sense that they were contributing to a global crisis that would affect many future individuals and non-human species. In addition the "harm" that they did cannot be disaggregated from the harms done by all other carbon emitters. Further, the victims of the harms are equally dispersed in time and space. They are island dwellers who may lose their homes in the twenty-first century, Inuit seal hunters today, and perhaps residents of Manhattan several generations from now.

Recently, increasingly emphatic statements by the IPCC (and the climate science community generally) about the causes and effects of global warming have begun to overcome these obstacles to perceiving global warming as a moral issue. While the link between facts and values may be forever fraught and contested, the more we know about the connections between our actions and their effects, the less difficulty we have in accepting ethical constraints on our behavior. As put slightly differently by E.O. Wilson, "[w]hen very little is known about an important subject, the questions people raise are almost invariably ethical. Then as knowledge grows, they become more concerned with information and . . . more narrowly intellectual. Finally, as understanding becomes sufficiently complete, the questions turn ethical again."[194] Thus, despite the challenges of spatial and temporal dispersion, it is apparent that a moral vocabulary is emerging. People all over the world, including several prominent American politicians, are expressing values of caring for future generations, other species, and particular vulnerable populations.[195] These articulations correlate with the mounting scientific evidence of what we have wrought. Despite the ethical distance many may have to travel to get from the paradigm moral problem of, "I knowingly hurt you," to "I, along with billions of others, am living my life in such a way as to deprive distant and/or future human beings and non-

194. EDWARD O. WILSON, BIOPHELIA 119 (Harvard Univ. Press 1984).

195. *See, e.g.*, Juliet Eilperin, *Lawmakers on Hill Seek Consensus on Warming*, WASH. POST, Jan. 31, 2007 at A6 (quoting lawmakers as urging action on global warming in order to protect future generations); Press Release, Office of the Governor, Gov. Schwarzenegger Signs Landmark Legislation to Reduce Greenhouse Gas Emissions (Sept. 27, 2006), http://gov.ca.gov/index.php?/press-release/4111/ (discussing Governor Schwarzenegger's speech urging action on global warming to protect future generations).

human species of a range of opportunities for an acceptable and/or flourishing life," we are beginning to make the trip.

A. Sustainability: Remarrying Humans and Nature

Despite the local and global emergence of various versions of an ethic that might equip us to take action on climate change, the United States has not internalized one as a matter of policy. There are and have been some important nods in that direction. But the prevailing norm since the turn of the millennium has been an antediluvian (or ante-Earth Day, anyway) version of utilitarianism, which reduces all manner of values, obligations, and concerns to a unitary economic measure.[196] This approach, derived from welfare economics,[197] currently dominates a great deal of environmental and natural resource decision-making. The executive agencies of the federal government are required, for example, to apply cost-benefit analysis to a wide range of proposed agency action.[198] In such a system, attachment to nature, whether spiritual or otherwise, has no greater *a priori* ethical weight than the preference for a bigger ski area, or a faster snowmobile ride.

What global warming may do is catapult us beyond this way of thinking. Addressing global warming will mean rethinking what growth and development should consist of. The world within which growth can take place has always been defined by our ethics. We do not, for example, include the possible economic benefits of free labor from slaves or children when we consider whether or not to issue permits for construction of a factory. What the problem of worldwide greenhouse emissions will do, however, is render apparent that the ethical constraints on our behavior come from many directions. Global warming makes visible the heretofore hidden kinds of exploitation that, if we were forced to think about them on a daily basis, should give us pause. For example, we might ask ourselves: Is it really worth displacing other people from their families and homes just so I can drive a big car; does my ski trip to Canada really measure up against the last drop of water in the Hopi's sacred aquifer? We might begin to see our daily behavior in light of its temporally and spatially dispersed, yet very real, effects.

Fortunately, we are not starting from scratch. Sustainability, an approach both centuries old and recently articulated, marries the ethical insights from the environmental movement with those from the human rights framework. It embodies the idea of viewing human and natural systems as interconnected, and of meeting all human needs in a manner that supports the health of the environment. "Sustainable development"

196. *See generally* FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (The New Press 2004).

197. *See id.* at 81-84.

198. Exec. Order No. 13,422, 72 Fed. Reg. 2763 (Jan. 18, 2007) (requiring "market failure" assessment of all planned agency action, and annual cost benefit analysis of all agency rules).

became a term of art after the publication of the Brundtland Report, which was the final report by the World Commission on Environment and Development.[199] The publication explores environmental and development issues in tandem, and concludes that governments world-wide must take simultaneous efforts to address poverty and environmental degradation so that meeting the basic needs of humanity is not perpetually in tension with the long-term health of the environment. As the publication explains:

> There has been a growing realization in national governments and multilateral institutions that it is impossible to separate economic development issues from environment issues; many forms of development erode the environmental resources upon which they must be based, and environmental degradation can undermine economic development. Poverty is a major cause and effect of global environmental problems. It is therefore futile to attempt to deal with environmental problems without a broader perspective that encompasses the factors underlying world poverty and international inequality.[200]

The report called on all nations of the world to adopt eight principles in order to integrate sustainable development into their policies. The principles are: (1) to revive growth in order to alleviate poverty, both for equitable and environmental reasons (noting that poverty is a major cause of environmental degradation); (2) to change the quality of growth: "[r]evived growth must be of a new kind in which sustainability, equity, social justice, and security are firmly embedded as major social goals"; (3) to conserve and enhance the resource base: "[s]ustainability requires the conservation of environmental resources such as clean air, water, forests, and soils; maintaining genetic diversity; and using energy, water, and raw materials efficiently"; (4) to ensure a sustainable level of population: "[p]opulation policies should be formulated and integrated with other economic and social development programmes—education, health care, and the expansion of the livelihood base of the poor"; (5) to reorient technology and manage risks; (6) to integrate environment and economics in decision-making; (7) to reform international economic relations; and finally (8) to strengthen international cooperation.[201]

A deep version of sustainability prescribes a way of living on the earth for all of us that allows each of us, in the company of nature, to thrive, but that proscribes any of us from living beyond our ecological means. Our "ecological means" now include our greenhouse gas emissions, which provide a material link between the many activities that render a consumption-oriented culture and economy unsustainable. The blueprint for such a worldview is available to us; it is the worldview em-

199. OUR COMMON FUTURE, *supra* note 11, at 8-9.
200. *Id.* at 3.
201. *Id.* at 363-65.

braced by American Indian tribes, described in Part II, *supra*. In his dissent in *Lyng v. Northwest Cemetery Protective Ass'n*, Justice William Brennan observed that Native American religions

> regard creation as an on-going process in which they are morally and religiously obligated to participate. . . . *Native Americans fulfill this duty through ceremonies and rituals designed to preserve and stabilize the earth and to protect humankind from disease and other catastrophes*. Failure to conduct these ceremonies in the manner and place specified . . . will result in great harm to the earth and the people whose welfare depends upon it.[202]

This is not a static, romanticized vision of people living in perpetual harmony with nature; rather it describes an ethical attitude that takes the form of daily habits and physical engagement, and is one that is strikingly well suited to the kinds of behavioral changes that will have to occur in a zero-emissions world.

Recently, many non-Indian communities committed to action on climate change have expressed these kinds of values, both in their positive laws and in their statements about why they are committed to addressing global warming. States, regions, cities, and even informal community groups have adopted emissions reductions goals and behaviors.[203] To provide just one example, recently in England, small groups have formed whose members pledge to one another to live low-carbon lives. Carbon Rationing Action Groups, or CRAGS, as they are called, are communities that keep one another true to their principles by formulating a yearly limit of emissions for members and then meeting regularly to monitor one another. According to a recent New York Times article, there are currently 160 people active in some twenty CRAGS across Britain.[204] The CRAG described in the Times has a yearly limit of 9,000 pounds of CO_2 per member. To put this in perspective, a single round-trip plane flight between London and Hong Kong generates 4,800 pounds of carbon. To meet their goals, members are changing their daily habits, using less light and different sources of fuel. According to the New York Times, CRAG member

> Jacqueline Sheedy has turned the former coal barge where she lives into a shrine to energy efficiency: she reads by candlelight in midwinter, converts the waste from her toilet into fertilizer, and hauls fresh water home on a trailer attached to her bicycle. Now Ms.

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202. Lyng v. Nw. Indian Cemetery Protective Ass'n, 485 U.S. 439, 460 (1988) (Brennan, J., dissenting) (citation omitted) (emphasis added).

203. *See* Sarah Krakoff, *Fragmentation, Morality, and the Law of Global Warming* 31-39 (University of Colorado Law School Legal Studies Research Paper Series, Working Paper No. 07-10, 2007), *available at* http://ssrn.com/abstract=976049.

204. James Kanter, *Members of New Group in Britain Aim to Offset Their Own Carbon Output*, N.Y. TIMES, Oct. 21, 2007, at A12.

> Sheedy has set herself a new goal: to stop burning coal for heat and instead use wood from renewable sources.[205]

Notwithstanding the relative intransigence of national and international governing institutions, many people at local levels have begun to live as if they could indeed participate in the creation of a sustainable world.

B. The Futility of Ethical Convergence?

Global warming provides the over-arching material connections that might render the ethical paradigm of sustainability concrete, meaningful, and urgent. CRAGs in England, cities and states throughout the United States, and individuals, communities, and countries world-wide appear to be internalizing just such an ethic despite the daunting spatial and intergenerational collective action features of global warming. In addition, we may finally be on the verge of achieving the external legal framework and accompanying government enforcement and coordination that would give full expression to the sustainability norm. And yet there remains the distinct possibility that we, as a global community, will fail to rein in our emissions in time to avert serious consequences. If we cannot act in time to preserve Native Alaskan subsistence traditions from devastation; if the Hopi's sacred waters dry up; if the Everglades are already a goner; if wild salmon and the cultures they sustain go extinct, is a restricted carbon diet just a hair-shirt exercise in futility?

There are two answers to this. The first is practical, and the second is metaphysical. Practically, in perpetuity there will be reason to reduce our greenhouse gas emissions even if we keep missing our mark. Absent miracle technological solutions (which at the moment are remote and will, in all likelihood, always be difficult to assess in terms of unintended consequences), the more emissions we add to the atmosphere, the warmer we will get. So even if we blow past the 2-4 degree increase that some scientists suggest could result in catastrophic effects, we will then want to focus on not getting to 8-10, or 10-12, or 12-14 degrees of average temperature increase, will we not? To those who might suggest that the potential futility of ever achieving a zero-emissions world points towards "adaptation only" policies, the rejoinder is that even adaptation will be an ever-changing proposition if we never stabilize global temperature increases.

Metaphysically, the likelihood of futility in the climate change context might be seen as a heightened version of the futility that haunts the entire human experience. The impulse to be good rarely comes with an accompanying guarantee of success. Yet there are other rewards in terms of how we feel about ourselves and our lives; our sense of meaning irre-

205. *Id.*

spective of positive results in our lifetimes. And to mingle the metaphysical with the practical, fostering the daily habits and rituals that reflect the ethic of climate sustainability might also prepare us and our progeny for a world of protean resource scarcity. Learning to live more locally and engaging in regular activities of caring for where we live might be the perfect ethical, cultural and social skill for life in a perpetually warming world.

CONCLUSION

In the fall of 2008, I taught an Advanced Indian Law seminar on American Indian Religion and Culture. Two of our classes covered sacred sites on public lands. We read *Lyng* and several lower court cases addressing these issues. We also took a field trip to the sacred site in our own back yard. Valmont Butte is east of downtown Boulder and is known to most local residents, if indeed it is known at all, as the rocky outcropping near the waste disposal facility. Perhaps in part because of this association, the City of Boulder bought the land several years ago intending to use it for firefighter training and a bio-composting site.[206] As soon as the City's plans became apparent, American Indian community members came forward to protest.[207] To them, Valmont Butte is a sacred site—a place of great spiritual significance to the tribes that used to inhabit this region and an ongoing location for ceremonies and caretaking by many tribes.[208] The American Indian constituents joined with a group of non-Indians whose ancestors had established a pioneer burial ground on the Butte to form the Valmont Butte Heritage Alliance (VBHA). Eventually, the City backed off of its plans and a settlement involving the possible transfer of the site to a land trust is moving forward.[209]

The afternoon was cold and grey, and a soft drizzle began to fall as my students and I got out of our cars in the muddy pull-out near Valmont Butte. Lori Windle, a VBHA board member, met us there, and then we hiked up the hill and were introduced to Nick Halsey, an Ojibwe tribal member who had lived at the Butte for two years. Nick was wearing a blue hooded sweatshirt and a baseball cap, blue jeans and work boots. If my students were expecting regalia and eagle feathers, they might have been disappointed. Nick was quiet for a time, and then said a prayer. He led us up past a couple of decrepit shacks, through a barbed wire fence, and up the trail to where he had set up a sweat lodge and a prayer circle. As he walked, he explained to us how contaminated the area was. Metals, including uranium, and a lot of ordinary trash polluted the Butte. He

206. VALMONT BUTTE HERITAGE ALLIANCE, EVENT TIMELINE (2007) http://www.valmontbutte.com/timeline.html (last visited Mar. 27, 2008).
207. *Id.*
208. *Id.*
209. *Id.*

also told us more than I thought he would about the meaning of the Butte to local tribes, the kinds of ceremonies he conducts to keep things in balance, and the relationship he has to the local hawks that nest there. We stood there in the rain at the top of the Butte for some time, taking in the view in every direction, the way the Arapaho and Ute people must have. A high point on the edge of the plains is no small thing. I wonder if at least some of my students felt that there was something to this "sacred site" business, even if the sacred is marred by years of degradation.

What Valmont Butte has to do with climate change is this: In the American Indian worldview, the point of life is to take care of where you live. You are a part of nature and it is a part of you. Nature changes, becomes polluted and even contaminated. But it remains your obligation to care for it. Every measure towards this end matters on a daily basis. These are the attitudes that might keep us on target to mitigate climate change by reducing and eventually eliminating our greenhouse gas emissions. Understanding the depth and beauty in these attitudes might also nudge us towards enacting the full range of remedies necessary to address the disparate effects climate change is having on American Indian communities. Finally, these are the same attitudes that our children and grandchildren will need if our generation continues to fail to address climate change, and they are living in a world requiring skills, flexibility, and engagement of a kind that we can only barely imagine.

CLIMATE LITIGATION: ETHICAL IMPLICATIONS AND SOCIETAL IMPACTS

MARILYN AVERILL[†]

ABSTRACT

Many people now agree that the global climate is changing and that human activities are a contributing factor, but disagree about who is responsible and what should be done. Some citizens are turning to the courts to resolve climate-related disputes. Climate litigation cases help to illuminate many of the legal, ethical, scientific, economic, social, and other complexities of climate change. These cases will decide rights and responsibilities, how uncertainties should be managed, and who should make societal decisions about climate change. The cases tell stories about climate causes and impacts, and identify potential winners and losers of both climate change and various policy alternatives. Climate litigation allows examination of ethical and social issues within the factual context of a legal case. These cases also illuminate the role of American courts in educating the public, stimulating debate, and setting or clarifying climate policy.

INTRODUCTION

Our global climate is changing. Most scientists now acknowledge the simple reality of global climate change and agree that increasing levels of greenhouse gases (GHGs) in the atmosphere are contributing to the change, but consensus fades as the discussion turns to the multiple causes of climate change, the degree to which human behavior drives it, and the advisability of various societal responses.[1] While scientific research continues to accumulate, many communities, particularly in the polar regions,[2] already feel the impacts of climate change, and local, national, and international communities are beginning to plan how to adapt to a changing climate.[3] Stresses of anticipated climate change drive some

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1. *See* WORKING GROUP I OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007—THE PHYSICAL SCIENCE BASIS 665-66 (2007) [hereinafter IPCC].

2. *See, e.g.*, ARCTIC CLIMATE IMPACT ASSESSMENT HIGHLIGHTS: IMPACTS OF A WARMING ARCTIC 34 (2004), http://amap.no/workdocs/index.cfm?action=getfile&dirsub=%2FACIA%2Foverview&filename=Finding2.pdf&CFID=6&CFTOKEN=CC50FD60-FC1B-EC67-2B9A10704FEE5347&sort=default.

3. *See* UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE: ADAPTATION, http://unfccc.int/adaptation/items/4159.php (last visited on Apr. 13, 2008); PEW CENTER ON GLOBAL CLIMATE CHANGE, CLIMATE CHANGE 101: ADAPTATION, http://www.pewclimate.org/docUploads/Adaptation_0.pdf (last visited Apr. 13, 2008).

citizens to advocate for societal responses to regulate human behavior or to compensate those adversely affected. Others think action is premature and are concerned about unnecessary and expensive overreaction to a complex and uncertain problem. Some citizens are turning to the courts to resolve climate-related disputes, filing a series of cases referred to as "climate litigation."

Climate change presents some of the most complex and most troubling issues of our time, and of our children's times for generations to come. As lawyers, we have obligations to our clients to be aware of how a changing climate may affect them, and of their rights and responsibilities with respect to the causes and impacts of a changing climate, in order to assist them in assessing possible liabilities and opportunities in planning for the future. As citizens, we have responsibilities to be aware of our role in climate change, how we contribute to climate change and how a changing climate may affect us, and to participate in public debates over how best to deal with the challenges of a changing climate. As citizens of the world, we should be aware of the international and intergenerational implications of climate change, and consider the rights and responsibilities, both legal and ethical, that we, our families, our community, our profession, our country, and our global society may have with respect to these issues.

Climate litigation helps to illuminate many of the legal, ethical, scientific, economic, social, and other complexities of the climate change debates. These cases will help to decide rights and responsibilities, how uncertainties should be managed, and who should make societal decisions about climate change. The cases tell stories about the causes and likely effects of climate change, and identify potential winners and losers of both climate change and various policy alternatives.

Lawyers presenting climate-related claims should think about impacts beyond the result in the immediate case. Climate litigation educates the public about climate issues and can influence public opinion on those issues, and provides support for various policy options. These cases can affect the perceived salience, credibility, and legitimacy of climate science and other expert testimony.[4] Climate litigation can trigger pressure for or against governmental action from local to international levels.

Climate disputes often focus on science and its attendant uncertainties, but this may mask fundamental underlying disputes over values and ethical issues. Climate change implicates the duties countries have to each other; the responsibility of those alive today for the well-being of

4. *See* David Cash et al., *Salience, Credibility, Legitimacy, and Boundaries: Linking Research, Assessment and Decision Making* 4 (John F. Kennedy Sch. of Gov't, Harvard Univ., Working Paper No. RWP02-046, 2002).

future generations; the responsibilities that humans have to protect natural systems; rights and responsibilities of citizens, corporations, and governments with respect to climate change; mitigating circumstances that may shift rights and responsibilities; and procedural rights for all stakeholders.

The subtitle of this Symposium is "Integrating Environmental Justice into Policy, Regulation, and Litigation." This article will focus on some of the ethical implications of climate-related lawsuits and other claims filed in United States courts or against the United States in other forums, and some of the broader societal impacts these cases are likely to have. Climate cases allow examination of ethical and social issues within the particular factual context of a legal case. They also illuminate the role of American courts in educating the public and contributing to policy relating to some of the most important issues of our time. This article begins with an overview of climate litigation in the context of the United States legal system, including a brief description of some of the more prominent cases. It then moves to a discussion of some of the ethical implications of climate litigation, and ends with a description of possible social impacts beyond the cases themselves.

I. THE UNITED STATES LEGAL SYSTEM

A. Law and Ethics

Concepts of ethics and justice permeate the U.S. legal system, as community standards have been incorporated into U.S. statutory and common law over the centuries. American law is a dynamic system that provides both the continuity of standards developed over the years, and the ability to adapt to new problems and shifting social norms. Law and ethics address similar issues, such as rights and responsibilities, but are far from identical. Law reflects standards and power structures in place in a community at a given point in time and serves both to regulate human behavior and to resolve disputes. Ethics are more aspirational, and reflect what different thinkers or schools have to say about the right way to live or about what ought to be done. Cases in litigation embed ethical arguments in a specific factual context, allowing more meaningful discussions about what is fair and equitable than may be possible in an abstract discussion.

Law incorporates and applies a selection of ethical standards but may privilege certain interests, either inadvertently or by design. To the extent that judges have discretion, their decisions may incorporate personal value systems and ways of thinking.[5] Furthermore, U.S. law re-

5. *See* RICHARD T. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 80-81 (2004); CASS R. SUNSTEIN ET AL., ARE JUDGES POLITICAL? AN EMPIRICAL ANALYSIS OF THE FEDERAL JUDICIARY 10 (2006).

flects U.S. standards, which may not be identical with standards in the international community. Nevertheless, U.S. cases can stimulate discussion about what is fair both domestically and internationally.

The adversarial model of the U.S. legal system provides voice and visibility to different points of view and helps to illuminate the complexities of issues. Champions—the lawyers on each side of a case—use every argument in their arsenals to support their client's case and to persuade the judge or jury to rule in their favor. Lawyers often assert the application of moral standards in legal cases. One side may argue about what is right or fair in a given situation, while opponents contend that the law does not and should not stretch to cover such moral arguments. Over time, courts have extended existing legal theories to cover many novel factual situations.

B. Climate Litigation

Climate-related cases in litigation play an important role in the debate over the ethical and social dimensions of climate change. They showcase ethical issues by telling stories about winners and losers situated in the particular factual context of the litigants and illustrate how actions by one country or industry can cause harm to others, even across national or generational boundaries. They establish whether and under what circumstances one party may be held responsible for its contributions to climate change. These cases serve an important civic educational function, presenting complex material in a format accessible to the average juror, and therefore the average citizen. They affect public perceptions of everything from basic climate science to the relationships among nations and the responsibilities that humans have to nature. Decisions in visible cases stimulate debate over what governments should or should not be doing in response to climate change, when parties should be held responsible for injuries, and the rights and responsibilities of individuals, industries, and governments from the local to the international level. Climate litigation allows study of the role of U.S. courts in the co-production of knowledge, in shaping ethical debates, and in the relationship between law and ethics in general. These cases also provide the public with a context within which to debate ethical issues of fairness, justice, and responsibility with respect to climate change.

Courts provide a controlled environment within which litigants may openly contest knowledge and values relating to climate change. Climate litigation combines science, ethics, economics, social, and other issues at a scale rarely addressed by American courts or by society in general. These cases pose new challenges and so provide an ideal context within which to examine how the U.S. legal system addresses and resolves novel problems, and how courts change or resist change in response to increasingly complex global problems.

Many of the ethical implications of climate litigation extend beyond decisions in individual cases. Judicial decisions can frame issues and trigger public debate over what is right or fair. Law, science, ethics, economics, and politics come together in climate litigation to co-produce knowledge, new concepts about what should be valued and considered in climate debates, and highlight which voices should be heard.[6] The cases will reflect social values and debates, and may incorporate changing social norms about environmental responsibility into new legal precedent.

This article examines some of the most visible climate-related cases filed in or against the United States in recent years. While cases have also been filed in other countries, especially in Australia,[7] the majority seem to have been filed in the U.S. This partly is because industrialized countries such as the United States account for most of the human contributions to GHGs in the atmosphere, far out of proportion to their populations.[8] At the same time, the U.S. has refused to enter into the Kyoto Protocol, the international community's attempt to begin to mitigate factors contributing to climate change, and has taken limited steps to reduce GHG emissions at the national level.[9] Many public and private entities have turned to the courts to try to force or block action on climate change. The U.S. provides a well established system of environmental laws that allows many challenges to governmental action, providing a logical forum for such suits. More international cases are likely to be filed in the future, but for now, the U.S. cases provide the best opportunity to study how courts are responding to climate change, including its ethical challenges.

This article does not attempt to suggest what the United States or the international community should do to mitigate or adapt to climate change. It simply considers how cases in litigation illuminate important ethical and social issues by presenting and arguing them within the context of the specific facts presented in individual climate lawsuits. This article is part of a larger study of the role American courts play in providing a controlled forum within which climate law, science, social science,

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6. *See, e.g.*, Sheila Jasanoff, *The Idiom of Co-Prodcuction, in* STATES OF KNOWLEDGE: THE CO-PRODUCTION OF SCIENCE AND SOCIAL ORDER 2-3 (Sheila Jasanoff ed., Routledge 2004); SHEILA JASANOFF, SCIENCE AT THE BAR: LAW, SCIENCE, AND TECHNOLOGY IN AMERICA 36-39 (Harvard Univ. Press 1995); Clark A. Miller, *The Study of Public Reasoning: Background Prepared for NSF Workshop on the Social Sciences and Science Policy* 1-2 (July 13-14, 2006), *available at* http://www.cspo.org/ourlibrary/papers/Miller.pdf.

7. For an Australian perspective on climate litigation, see JOSEPH SMITH & DAVID SHEARMAN, CLIMATE CHANGE LITIGATION: ANALYSING THE LAW, SCIENTIFIC EVIDENCE & IMPACTS ON THE ENVIRONMENT, HEALTH & PROPERTY 59-61 (2006).

8. *See, e.g.*, Kevin Baumert & Jonathan Pershing, *Climate Data: Insights and Observations* 11 (2004), *available at* http://www.pewclimate.org/docUploads/Climate%20Data%20new.pdf; ROBERT HENSON, THE ROUGH GUIDE TO CLIMATE CHANGE 17, 38 (Rough Guides 2006).

9. *See* John C. Dernbach, *U.S. Policy, in* GLOBAL CLIMATE CHANGE AND U.S. LAW 78 (Michael B. Gerrard ed., 2007).

ethics, and other issues are contested to co-produce knowledge that leads to direct and indirect influences on climate policy.

II. THE UNITED STATES CLIMATE CASES

The cases filed to date in the United States may be divided into those intended to force or block government action with respect to climate change, and those seeking compensation or other remedies for alleged injuries. Within that division, cases may be categorized according to their primary legal claims. A few of the early and more visible cases are described below.[10]

A. Cases to Influence Government Action

1. Authority and Responsibility

In *Massachusetts v. EPA*,[11] numerous states, cities, an American Territory, and environmental nongovernmental organizations (NGOs) brought claims against the U.S. Environmental Protection Agency (EPA) challenging the agency's decision not to regulate GHG emissions from motor vehicles under the Clean Air Act (CAA).[12] Plaintiffs claimed that EPA had both the authority and responsibility to regulate. The U.S. Supreme Court decided in a 5-4 opinion that the CAA does give EPA the authority to regulate, and returned the decision to EPA to decide whether it should regulate GHG emissions from motor vehicles under the terms of the CAA.[13]

2. Procedural Requirements

In *Friends of the Earth, Inc. v. Watson*,[14] nongovernmental organizations and cities brought suit against two federal agencies involved in financing large projects in other countries.[15] Plaintiffs alleged that the agencies failed to comply with the National Environmental Policy Act (NEPA) by neglecting to consider project impacts on climate when conducting environmental reviews.[16] The judge ruled that NEPA applies to major federal actions that affect climate change.[17] Other cases have al-

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10. For a more extensive overview of individual cases, see generally GLOBAL CLIMATE CHANGE AND U.S. LAW, *supra* note 9. For updates, see American Bar Association, Updates for Global Climate Change and U.S. Law, http://www.abanet.org/abapubs/globalclimate/ (last visited Mar. 26, 2008).

11. 127 S. Ct. 1438 (2007).

12. *Id.* at 1446.

13. *Id.* at 1460, 1463.

14. No. C 02-4106 JSW, 2005 U.S. Dist. LEXIS 42335 (N.D. Cal. Aug. 23, 2005) (order denying defendant's motion for summary judgment).

15. *Id.* at *1. NGOs Friends of the Earth and Greenpeace, along with cities of Oakland, Acadia, and Santa Monica, California and Boulder, Colorado, brought suit against the Export-Import Bank of the U.S. and the Overseas Private Investment Corporation. Other procedural suits seek compliance with other environmental statutes.

16. *Id.*

17. *See id.* at *8.

leged procedural deficiencies under the Endangered Species Act and other laws, as well as related state laws.[18]

3. Federal Preemption

Thirteen car dealers and the American Alliance of Automobile Manufacturers brought suit against the California Air Resources Board (CARB) in *Central Valley Chrysler-Jeep, Inc. v. Witherspoon*,[19] alleging that federal law preempted the state's regulation of GHG emissions from motor vehicles.[20] Plaintiffs asked that California be enjoined from implementing its GHG emission regulations. The judge found that the federal CAA preempted California's program to regulate greenhouse gas emissions, and enjoined the state from enforcing its program until EPA issues a preemption waiver or Congress permits California to carry out its regulations.[21] The EPA denied California's request for a CAA waiver on December 19, 2007.[22] On January 2, 2008, California filed a Petition for Review of the EPA's decision to the United States Court of Appeals for the Ninth Circuit.[23]

B. Cases Alleging Liability for Injuries

1. Public and Private Nuisance

In *Connecticut v. American Electric Power Co.*,[24] eight states[25] and New York City filed claims against five of the biggest power companies in the United States,[26] alleging that emissions of carbon dioxide from the companies' power plants constituted "ongoing contributions to a public nuisance." The plaintiffs asked that the companies be ordered to reduce their emissions by a specified percentage every year for at least a decade.[27] The judge dismissed the case because "these actions present non-

18. *See, e.g.*, Natural Res. Def. Council v. Kempthorne, 506 F. Supp. 2d 322, 330 (E.D. Cal. 2007); Cent. for Biological Diversity v. Brennan, No. C 06-7062 SBA, 2007 WL 2408901, at *1-3 (N.D. Cal. Aug. 21, 2007)..

19. No. CV-F-04-6663 REC/LJO, 2005 U.S. Dist. LEXIS 26536 (E.D. Cal. Oct. 20, 2005).

20. *Id.* at *3-4. Similar actions have been filed against other states seeking to adopt the CARB standards. *See* Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295, 300 (D. Vt. 2007).

21. Cent. Valley Chrysler-Jeep, Inc. v. Goldstone, No. CV F 04-6663 AWI LJO, 2007 U.S. Dist. LEXIS 91309, at *111-15 (E.D. Cal. Dec. 11, 2007). The case name was changed after James Goldstone replaced Catherine Witherspoon as the primary named defendant. *Id.* at *6 n.1.

22. Letter from Stephen L. Johnson, Administrator of EPA, to Arnold Schwarzenegger, Governor of California (Dec. 19, 2007), *available at* http://epa.gov/otaq/climate/20071219-slj.pdf [hereinafter Letter]; *see also* Dot Earth, http://dotearth.blogs.nytimes.com/2007/12/19/epa-to-states-co2-is-not-your-problem/?scp=1-b&sq=E.P.A.+to+States%3A+CO2+Is+Not+Your+Problem&st=nyt (Dec. 19, 2007, 20:34 EST).

23. California v. U.S. Envtl. Prot. Agency, No. 08-70001 (9th Cir. filed Jan. 2, 2008).

24. 406 F. Supp. 2d 265 (S.D.N.Y. 2005).

25. *Id.* at 267. The eight states are California, Connecticut, Iowa, New Jersey, New York, Rhode Island, Vermont, and Wisconsin.

26. *Id.* The power companies include American Electric Power Co., Inc., The Southern Co., Cinergy Corp., Tennessee Valley Authority, and Xcel Energy, Inc.

27. *Id.* at 270 ("Here, to curtail Defendants' contribution to global warming, Plaintiffs 'seek an order (i) holding each of the Defendants jointly and severally liable for contributing to an ongoing

justiciable political questions that are consigned to the political branches, not the Judiciary."[28]

2. Human Rights

Sheila Watt-Cloutier, then chairperson of the Inuit Circumpolar Council (ICC), and with the support of the Council, brought a petition before the Inter-American Commission on Human Rights (IACHR).[29] The petition alleged that the United States violated the human rights of the Inuit people by failing to control emissions of GHGs.[30] The IACHR refused to hear the case but requested a presentation on the issues.[31]

III. ETHICAL DIMENSIONS

A. Common Concern of Mankind

Our global climate is a public resource or public good, available to and relied upon by all living systems of the world. No one can be excluded from the benefits and other impacts of climate, and all are affected by it. The opening lines of the Preamble to the United Nations Framework Convention on Climate Change (UNFCCC) define climate change as "a common concern of humankind."[32] Many believe that the global climate is subject to the "tragedy of the commons," in which everyone uses the resource but no one has responsibility for protecting it.[33] Litigation is one strategy to establish responsibility for protecting, and liability for injuring, our global climate commons.

Climate litigants have asserted a variety of legal theories in their attempts to protect the global climate. *Massachusetts v. EPA* demonstrates that EPA has responsibility for GHG emissions under the CAA.[34] *Friends of the Earth* alleges that federal agencies have a responsibility to consider impacts on climate when conducting environmental reviews.[35] Cases apply many legal theories to show that humans are responsible for the global commons.

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public nuisance, global warming, and (ii) enjoining each of the Defendants to abate its contribution to the nuisance by capping its emissions of carbon dioxide and then reducing those emissions by a specified percentage each year for at least a decade.'").

28. *Id.* at 274.

29. Sheila Watt-Cloutier, *Petition to the Inter American Commission on Human Rights, Seeking Relief from Violations Resulting from Global Warming Caused by Acts and Omissions by the United States* (Dec. 7, 2005), *available at* http://www.earthjustice.org/library/legal_docs/petition-to-the-inter-american-commission-on-human-rights-on-behalf-of-the-inuit-circumpolar-conference.pdf.

30. *Id.* at 1-8.

31. Press Release, The Ctr. for Int'l Envtl. Law, Global Warming and Human Rights Gets Hearing on World Stage, (Mar. 5, 2007), http://www.ciel.org/Climate/IACHR_Inuit_5Mar07.html.

32. United Nations, *United Nations Framework Convention on Climate Change*, 31 I.L.M. 849, 851 (1992) [hereinafter UNFCCC].

33. *See* Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1244 (1968) (magazine).

34. 127 S. Ct. 1438, 1459-60 (2007).

35. No. C 02-4106 JSW, 2005 U.S. Dist. LEXIS 42335, at *4-5, *27 (N.D. Cal. Aug. 23, 2005) (order denying defendant's motion for summary judgment).

B. Procedural Justice

Procedural justice considers whether the process used to reach a decision is fair.[36] Scholars may disagree, however, as to what constitutes a fair process. John Rawls would call for a "veil of ignorance" so that those deciding would be unaware of the costs and benefits to themselves.[37] Others would require a democratic process in which all affected parties have a meaningful voice.[38] Still others maintain that careful procedures specifying what must be proven and what qualifies as evidence will achieve procedural justice.[39]

American courts have instituted many rules to provide procedures that are fair, are perceived by the public to be fair, and are intended to reach consistent results. Litigants must meet high burdens of proof on specific elements of causes of action. Rules of evidence constrain the litigation process to ensure that evidence presented meets high standards of relevance, legitimacy, and credibility. These well-established rules will help to ensure that climate litigation meets high standards of procedural fairness.

C. Democratic Principles

The United States does not yet have a clear legal framework spelling out rights and responsibilities of individuals, institutions, and, particularly, government agencies, for climate change.[40] Litigants have turned to the courts to demonstrate that existing laws can be stretched to cover climate change. In *Massachusetts v. EPA*,[41] a divided Supreme Court ruled that the CAA can indeed be used to regulate GHG emissions from the tailpipes of motor vehicles, and returned the case to EPA to determine whether such emissions should be regulated under the terms of the CAA.[42] *Friends of the Earth* alleged that NEPA environmental reviews should consider the impacts of federal action on climate, and that other cases should clarify whether the Endangered Species Act, the Marine Mammals Protection Act, and other statutes include climate-related concerns within their ambit.[43]

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36. GEORGE P. FLETCHER, BASIC CONCEPTS OF LEGAL THOUGHT 81-82 (Oxford Univ. Press 1996).

37. JOHN RAWLS, A THEORY OF JUSTICE 12 (Harvard Univ. Press 1971).

38. *See* Gary Bryner, *Assessing Claims of Environmental Justice, in* JUSTICE AND NATURAL RESOURCES: CONCEPTS, STRATEGIES, AND APPLICATIONS 31, 44-45 (Kathryn Mutz et al. eds., 2002).

39. *See id.*

40. Michele M. Betsill & Roger A. Pielke, Jr., *Blurring the Boundaries: Domestic and International Ozone Politics and Lessons for Climate Change*, INT'L ENVTL. AFFAIRS, Summer 1998, at 147, 161-62.

41. 127 S. Ct. 1438 (2007).

42. *Id.* at 1463.

43. *See* No. C 02-4106 JSW, 2005 U.S. Dist. LEXIS 42335 (N.D. Cal. Aug. 23, 2005) (order denying defendant's motion for summary judgment).

As a democratic society, the United States expects its courts to operate consistent with democratic principles, but litigants, judges, and academics differ as to what democracy requires with respect to environmental litigation in general and climate litigation in particular. The debate comes down to who should be making decisions regarding climate change. Should courts determine rights and responsibilities, should they defer to the judgments of executive agencies, or should they leave all such decisions to Congress? Should states be allowed to regulate GHG emissions, or has Congress precluded states from taking action through federal regulation? Is accountability best served by leaving policy decisions to elected officials or by allowing citizens to challenge governmental action or inaction through the courts?

Scholars debate the influence that environmental litigation in general and climate litigation in particular has on democratic processes. Joseph Sax describes environmental litigation as "a means of access for the ordinary citizen to the process of governmental decision-making."[44] Sheila Jasanoff emphasizes the importance of litigation in civic education and in providing information "about the epistemological, social, and moral dilemmas" associated with science and technology issues.[45] Others argue that environmental litigation undermines democracy by shifting decisions away from elected officials.[46] Robert Kagan maintains that adversarial legalism can block cooperation and frustrate justice.[47]

Climate litigation contributes to public participation in various ways.[48] It allows citizens to challenge governmental actions they believe are improper, such as EPA's decision not to regulate GHGs under its CAA authority. Litigation provides a forum within which plaintiffs may seek relief for perceived injuries, as demonstrated in both the public nuisance cases and the Inuit human rights claim. As discussed in more detail below, these cases educate the public about major issues relating to climate change. Litigation can stimulate public debate as to what should happen and encourage additional political action.

Climate litigation can give voice to minority interests, but these cases are expensive and not available to everyone. In some cases, groups such as environmental NGOs and industry associations provide access to courts that might not be available to individual litigants. For example, Earthjustice and the Center for International Environmental Law have

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44. Joseph L. Sax, *Defending the Environment: A Strategy for Citizen Action*, *in* LAW AND THE ENVIRONMENT: A MULTIDISCIPLINARY READER 300-05 (R.V. Percival & D.C. Alevizatos eds., Temple Univ. Press 1998).

45. JASANOFF, 1995, *supra* note 6, at 21.

46. Marilyn Averill, *Climate Litigation: Democratic Participation and Civic Education* (Mar. 2006) (paper presented at the *Western Political Science Association* annual meeting in Albuquerque) (on file with author).

47. ROBERT A. KAGAN, ADVERSARIAL LEGALISM: THE AMERICAN WAY OF LAW 4 (Harvard Univ. Press, 2003).

48. Averill, *supra* note 46, at 2.

helped the Inuit to make their voices heard in a variety of international forums.[49]

Massachusetts v. EPA[50] was as much a debate over the separation of powers as it was about climate change. At the D.C. Circuit level, three judges wrote three wildly different opinions about how the case should be decided, but really focused on *who* should decide—a federal agency, Congress, or the courts?[51] The Supreme Court majority and dissenting opinions engaged in a similar debate. *Connecticut v. American Electrical Power Co.*[52] reflected similar concerns; the judge dismissed the case as a "political question," one that should be addressed through a political process rather than by the courts.[53]

Climate litigation also involves questions about the appropriate level for making decisions about climate policy. Who has the authority and responsibility to regulate GHGs? When does federal policy preempt state action? Automobile manufacturers have filed suit to block California from implementing its standards for vehicle emissions, and to block other states from adopting the California standard, claiming that such decisions belong to the federal government.[54]

Courts serve procedural justice by allowing citizens access to the decision-making process, particularly by challenging government action or inaction, but the expense of litigation limits access. Courts may reach decisions contrary to those of the executive, but Congress can override most decisions with which it disagrees. The debate over who should decide is likely to continue until either Congress or the courts provide a clearer legal framework for climate change.

D. Rights, Responsibilities, and Liability

Discussions about climate change at the domestic and international levels often focus on responsibility and liability.[55] Who should be held responsible for our changing climate, and what should they be required to do? What circumstances should excuse responsibility? Who will be injured by climate change, and how can they be protected from or com-

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49. Press Release, Earthjustice, Inuit Human Rights Petition File Over Climate Change (Dec. 7, 2005), http://www.earthjustice.org/news/press/005/inuit-human-rights-petition-filed-over-climate-change.html.

50. 127 S. Ct. 1438 (2007).

51. Massachusetts v. EPA, 415 F.3d 50 (D.C. Cir. 2005).

52. 406 F. Supp. 2d 265 (S.D.N.Y. 2005).

53. *Id.* at 274.

54. *See, e.g.*, Cent. Valley Chrysler-Jeep, Inc. v. Witherspoon, 456 F. Supp. 2d 1160 (E.D. Cal. 2006). These cases were rendered moot, at least temporarily, on Dec. 19, 2007, when EPA denied California's request for a waiver to the Clean Air Act. *See* Letter, *supra* note 22. California has petitioned for review of the decision.

55. DONALD BROWN ET AL., WHITE PAPER ON THE ETHICAL DIMENSIONS OF CLIMATE CHANGE 8, *available at* http://www.ndsciencehumanitiespolicy.org/resources/climate_change_white_paper.pdf (last visited Mar. 26, 2008).

pensated for injuries? Climate litigation addresses some of these issues head on.

According to Dale Jamieson, "[a] paradigm moral problem is one in which an individual acting intentionally harms another individual, both the individuals and the harm are identifiable, and the individuals and harm are closely related in time and space."[56] Jamieson uses six increasingly complex stories about bicycle thefts to illustrate the difficulties in treating climate change as a moral problem. Virtually everyone around the globe contributes to and will be affected by climate change. Actions taken in the past, or today, will have impacts that persist for decades or centuries.[57] Activities undertaken in all countries, from GHG emissions to agricultural practices to deforestation, affect the global climate.[58] These activities were not intended to change the climate; in most cases, they were intended to promote societal benefits such as economic development. Energy users probably were aware of their emissions but not of the possible impacts on climate, although such impacts have become well known in the last decade. Linking specific climate injuries to specific causes will be extremely difficult, complicating arguments about ethical implications.

Legal issues are similar to those in the moral paradigm. Law provides causes of action through which those injured may seek redress, but law also protects those alleged to contribute to injuries in order to avoid holding them responsible for frivolous claims. Both law and ethics are concerned with defining rights and responsibilities and with deciding who should be held responsible or legally liable for harm. Law is grounded in ethical principles but turns them into legal rules that may be applied with some consistency in the courts. For example, general ethical principles define general duties that one person holds to others. Law turns duties into rules about how someone can be held responsible in a given context.

Both the classic moral paradigm and law address the conditions under which an individual or other entity may be held responsible for behavior. Jamieson lists intentionality and spatial and temporal proximity as important factors in establishing responsibility.[59] Law joins these norms with other community standards into a system that allows for the determination of responsibility in a given context or a given case. Causes of action specify the elements that must be proven. Burdens of

56. Dale Jamieson, *The Moral and Political Challenges of Climate Change*, *in* CREATING A CLIMATE FOR CLIMATE CHANGE: COMMUNICATING CLIMATE CHANGE AND FACILITATING SOCIAL CHANGE 475 (Suzanne C. Moser & Lisa Dilling eds., Cambridge Univ. Press 2007).

57. IPCC, *supra* note 2, at 23-24.

58. *See generally* Working Group III of the Intergovernmental Panel on Climate Change, Climate Change 2007—Mitigation of Climate Change (2007) (provides an overview of the many human activities contributing to climate change).

59. Jamieson, *supra* note 56, at 475.

proof indicate the degree of certainty that must be obtained, and who must meet that burden. Rules of evidence ensure that expert testimony, data, and other evidence meet high standards of relevance, credibility, and legitimacy.

"[A]s a general rule, the imposition of liability depends upon a showing by the plaintiff that his or her injuries were caused by an act of the defendant or by an instrumentality under the defendant's control."[60] Climate change presents serious causation problems and questions about how much proof of a causal link between a defendant's behavior and a plaintiff's injury is required in order to make fair decisions about assigning responsibility and requiring compensation or other relief.

The majority in *Massachusetts v. EPA* found sufficient evidence of causation to support standing,[61] but Chief Justice Roberts disagreed in his dissent, saying "the connection is far too speculative to establish causation."[62] A case seeking to establish liability, as in the Inuit claim or the public nuisance case, would face even higher burdens of proof.

In spite of the split decision, *Massachusetts v. EPA* may profoundly shift the causation debate. Most of the climate science was uncontested by the litigants, and the Court acted as if climate change and its impacts are widely accepted as a reality. The Court accepted, at least for standing purposes, the likelihood that federal regulation could reduce the impacts of climate change. This endorsement of a causal link between human activities and climate impacts undoubtedly will be cited in future climate disputes.

Ethicists may conceive of multiple contributing factors, but philosophers rarely have to make specific decisions about how to allocate liability among those responsible. Courts must make allocation decisions in any case involving more than one responsible party. Over time, U.S. courts have demonstrated their ability to establish legal rules controlling the increasingly complex cases presented by a modern industrial society. For example, in *Sindell v. Abbott Laboratories*,[63] the court found a way to allocate liability among many pharmaceutical manufacturers of a drug that contributed to patient injuries.[64]

Climate change presents an infinitely more complicated web of interwoven causal factors, but courts, at least in theory, seem capable of adjusting to increasingly complicated factual situations. Law shifts with changes in society to incorporate new factual systems and new legal

60. Sindell v. Abbott Laboratories, 607 P.2d 924, 928 (Cal. 1980), *cert. denied*, 449 U.S. 912 (1980).
61. Massachusetts v. EPA, 127 S. Ct. 1438, 1453 (2007).
62. *Id.* at 1469 (Roberts, C.J., dissenting).
63. 607 P.2d 924 (1980).
64. *Id.* at 928.

theories.[65] The majority in *Massachusetts v. EPA* recognized this in saying that Congress understands that "without regulatory flexibility, changing circumstances and scientific developments would soon render the Clean Air Act obsolete."[66]

What should excuse responsibility for contributions to climate change? President Bush cites possible injury to the U.S. economy as the reason not to sign the Kyoto protocol.[67] Litigants cite the magnitude of likely economic injury as a reason that the decision should be taken from the courts.[68] Others claim that such arguments are unethical.[69] The Supreme Court has not yet decided "whether policy concerns can inform EPA's actions"[70] if it decides that carbon dioxide reaches the level of endangerment, as specified in the CAA. Future courts undoubtedly will have to deal with arguments regarding the high costs of dealing with climate change, and how and where those costs should be imposed.

E. Scientific Uncertainty

Uncertainty runs rampant throughout climate change and clouds the science, economics, social impacts, and even the ethical issues.[71] Aleatory uncertainties are inherent in a model or system and are irreducible. Epistemic uncertainties relate to what we know, and may be reduced as knowledge increases. The role uncertainty plays in determining what to do about climate change has triggered fierce debates. President Bush maintains that action to limit GHG emissions would be premature without better understanding of the causes and effects of climate change.[72] Others call such inaction unethical.[73]

The parties to the UNFCCC explicitly considered the role that scientific uncertainty should play in climate decisions. The UNFCCC acknowledges some of the uncertainties and adopts a precautionary principle: "Where there are threats of serious or irreversible damage, lack of scientific certainty should not be used as a reason for postponing" meas-

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65. *See* PHIL HARRIS, AN INTRODUCTION TO LAW 1 (7th ed. 2007); LAZARUS, *supra* note 5, at 1; MILLER, *supra* note 6, at 1.

66. 127 S. Ct. at 1462.

67. Press Release, The White House, President Announces Clear Skies & Global Climate Change Initiatives (Feb. 1, 2002), *available at* http://www.whitehouse.gov/news/releases/2002/02/20020214-5.html.

68. *See* BROWN ET AL., *supra* note 55, at 29-30.

69. *Id.* at 29-32 (arguing, *inter alia*, that no one has the right to protect economic health by harming others).

70. 127 S. Ct. at 1463.

71. *See generally* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: FOURTH ASSESSMENT REPORT (Cambridge Univ. Press 2007) (carefully portraying uncertainties in the science and highlights key uncertainties).

72. Press Release, The White House, President Bush Discusses Global Climate Change (June 11, 2001), *available at* http://www.whitehouse.gov/news/releases/2001/06/20010611-2.html; *see also* Richard A. Kerr, *Climate Change: Major Challenges for Bush's Climate Initiative*, SCIENCE, July 13, 2001, *available at* http://www.sciencemag.org/cgi/content/full/293/5528/199.

73. BROWN ET AL., *supra* note 55, at 23-28.

ures to prevent or mitigate the causes and adverse effects of climate change.[74] But the principle contains conditioning language that requires cost-effective actions and consideration of impacts on all economic sectors. The exact reach of the UNFCCC precautionary principle remains unclear as to what kinds of actions might be required at different levels of uncertainty about the degree of threat, the likelihood of harm, or the degree of human influence. The language itself is uncertain enough to reduce its potential as a legal standard.

Litigants use uncertainty to gain an advantage in arguing climate cases, and case outcomes may depend on perceptions about the adequacy of current knowledge about climate change. Court decisions can both resolve questions about scientific uncertainty, at least in the legal context, and influence the way the public views uncertainty. For example, in *Massachusetts v. EPA*, the majority said: "A well-documented rise in global temperatures has coincided with a significant increase in the concentration of carbon dioxide in the atmosphere. Respected scientists believe the two trends are related."[75] This statement recognizes the reality of climate change and lends credibility to the correlation between carbon dioxide build up and rising temperatures. Nevertheless, the Court also recognized that uncertainty remains problematic, and left the door open for EPA to decide that "scientific certainty is so profound that it precludes EPA from making a reasoned judgment as to whether greenhouse gases contribute to global warming."[76]

F. Intra-Generational Equity and the Responsibility to Protect

Climate change fundamentally involves questions of intra-generational equity, both among nations and among economic groups within nations. Human activities contributing to climate change, such as GHG emissions and deforestation, occur locally but have global effects. GHGs accumulate in the air and circulate around the globe, affecting climate patterns throughout the world.[77] Adverse impacts are likely to be felt far from the sources of emissions. At the country level, those contributing most to climate change may be among those least affected, raising major questions about equity, fairness, and under what conditions an entity such as a nation, a corporation, or an industry should be held responsible for its contributions to a changing climate. Both within and between nations, the poor are likely to suffer the most severe effects, both because they tend to live in more environmentally sensitive areas

74. UNFCCC, *supra* note 32, at 854.
75. 127 S. Ct. at 1446.
76. *Id.* at 1463.
77. *See generally* IPCC, *supra* note 2.

and because they lack adequate resources to adapt to a changing climate, raising serious issues of environmental justice.[78]

What responsibility do the people of one nation have to protect the well being of people from other nations? International law has adopted numerous principles, generally stating that a state is not permitted to take actions that will cause injuries beyond its borders.[79] These principles will be strained by climate change problems, in which virtually everyone contributes to the problem and everyone will be affected. The climate change regime explicitly allows some forms of differential treatment in international law.[80] For example, the UNFCCC itself provides for "common but differentiated responsibilities" among nations.[81] But these differences were generally adopted to correct perceptions of past inequities and to accommodate varying capacities to deal with climate change. They were not intended to allow one nation to undertake activities that would harm others outside of its borders.

Similar questions may be asked about the responsibilities that countries have to protect the most disadvantaged among their citizens. American courts have dealt with various environmental justice issues in recent years, but not of the magnitude presented by climate change.

Most of the current U.S. climate cases do not directly involve international issues. Two exceptions are *Friends of the Earth v. Watson,*[82] which involves U.S. agencies that fund projects overseas, and the Inuit human rights petition,[83] which involves injuries to people in the polar regions of Canada and the U.S. More such cases can be expected in the future as more people around the world sustain injuries they believe can be attributed to climate change induced by emissions from industrialized societies.

G. Inter-Generational Equity

What responsibilities do people alive today have for the well-being of people of the future? The U.S. legal system has little to say about this issue, although some specific laws, particularly environmental laws, have provisions for the benefit of future generations. Attorneys typically apply principles of discounting, borrowed from economics, to consider and

78. NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW 106-07 (Cambridge Univ. Press 2006).

79. *See, e.g.*, REBECCA M. BRATSPIES & RUSSELL A. MILLER EDS., TRANSBOUNDARY HARM IN INTERNATIONAL LAW: LESSONS FROM THE TRAIL SMELTER ARBITRATION (Cambridge Univ. Press 2006); BROWN ET AL., *supra* note 55, at 13-14.

80. LAVANYA RAJAMANI, DIFFERENTIAL TREATMENT IN INTERNATIONAL ENVIRONMENTAL LAW 11, 176 (Oxford Univ. Press 2006).

81. UNFCCC, *supra* note 32, at 854.

82. Friends of the Earth, Inc. v. Watson, No. C 02-4106 JSW, 2005 U.S. Dist. LEXIS 42335 (N.D. Cal. Aug. 23, 2005) (order denying defendant's motion for summary judgment).

83. *See, e.g.*, Watt-Cloutier, *supra* note 29.

monetize the effects of actions taken today on the future.[84] The magnitude of the discount rate makes an enormous difference in how future injuries are valued in economic analysis.[85] As a result, much of the debate over inter-generational equity has focused on the appropriate choice of a discount rate.[86]

Courts have a long history of accepting evidence about future injuries and are accustomed to using discount rates. Pollution cases require discounting to figure future losses to the public until resources can be adequately remediated.[87] Tort cases require estimates of future earnings.[88] Certain conventions have emerged with respect to discount rates. The federal government, for example, specifies rates that it should apply in certain contexts.[89]

The magnitude of likely adverse effects of climate change on future generations has intensified the ethical and emotional debate over inter-generational equity. Courts eventually will need to decide issues regarding liability for injuries likely to occur in the future. For now, most of the courtroom debate centers on the present.

H. Inter-Species Equity and Responsibility to Nature

The rights that natural objects have in U.S. courts largely remain unsettled. Environmental cases typically involve challenges to standing—to whether the plaintiffs have a right to bring their claims before a court. One question has been whether non-human objects such as trees or ecosystems have a right to be represented in court.[90] Specific environmental laws, such as the Endangered Species Act, protect certain natural species or systems, but few non-statutory responsibilities have been identified that require humans to protect other natural objects, except when they are owned by humans. Philosophers have been more specific about humans' obligations to nature.[91]

Climate cases to date have addressed other species either through their utility for human communities or within the context of a specific U.S. law. These laws have great power, and may provide the earliest successes on climate litigation. Procedural cases such as *Friends of the*

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84. STERN, *supra* note 78, at 50-60.
85. *Id.*
86. *Id.*
87. *Id.*
88. RESTATEMENT (SECOND) OF TORTS § 913A cmt. a (2007).
89. *See* OFFICE OF MGMT. AND BUDGET, MEMORANDUM FOR HEADS OF EXECUTIVE DEP'TS & ESTABLISHMENTS (1992), http://www.whitehouse.gov/omb/circulars/a094/a094.html.
90. *See, e.g.*, CHRISTOPHER D. STONE, SHOULD TREES HAVE STANDING? AND OTHER ESSAYS ON LAW, MORALS, AND THE ENVIRONMENT 6-7 (Oceana Publ'ns 1996).
91. *See generally* HOLMES ROLSTON III, ENVIRONMENTAL ETHICS: DUTIES TO AND VALUES IN THE NATURAL WORLD (Temple Univ. Press 1988); PETER SINGER, PRACTICAL ETHICS (2d ed., Cambridge Univ. Press 1993).

Earth[92] that seek to have the impacts of climate change included as part of agency environmental reviews have a lower standard for causation to establish standing and are more likely to succeed than cases seeking to establish responsibility and liability. Success in these cases will make climate more visible and ensure that agencies consider the effects their actions may have on climate, and its resulting impacts on ecosystems, humans, and other species. A California judge has already found a biological opinion on the Delta smelt to be inadequate under the Endangered Species Act, in part because it failed to consider the stresses of climate change.[93] Other cases seek similar rulings under other statutes.[94] Increased visibility will encourage debate over the role that federal agencies have to protect nature from a changing climate.

IV. SOCIETAL IMPACTS

In a globalized world, actions taken in one place are likely to have impacts that cross spatial, temporal, political, and scalar boundaries. Arguments and decisions in climate cases may have repercussions far beyond the narrow interests of the litigants themselves. Each case, of course, may serve as precedent for future decisions, or as an incentive to file additional complaints, either within the United States or elsewhere. But decisions in climate litigation also have impacts that extend beyond the legal system itself to the way society thinks about and responds to the challenges of climate change.

A. Civic Education and Debate

Perhaps the most important connection between climate litigation and both ethical issues and societal impacts lies in the civic education function of litigation in the United States.[95] Climate cases tell stories about the causes and impacts of climate change. These stories are intended to persuade judges and juries, and consequently are written in language accessible to non-scientists. They identify possible winners and losers in climate change, and make climate injury claims come alive. For example, the Inuit, who are among the first to feel the negative impacts of climate change, have been very effective at telling their story and in turning it into a human rights claim. While the initial claim itself

92. No. C 02-4106 JSW, 2005 U.S. Dist. LEXIS 42335 (N.D. Cal. Aug. 23, 2005) (order denying defendant's motion for summary judgment).

93. Natural Res. Def. Council v. Kempthorne, 506 F. Supp. 2d 322, 330 (E.D. Cal. 2007).

94. *See id.*; Cent. for Biological Diversity v. Brennan, No. C 06-7062 SBA, 2007 WL 2408901, at *1-3 (N.D. Cal. Aug. 21, 2007).

95. Marilyn Averill, *Climate Litigation: Shaping Public Policy and Stimulating Debate*, *in* CREATING A CLIMATE FOR CHANGE: COMMUNICATING CLIMATE CHANGE AND FACILITATING SOCIAL CHANGE 462-71 (Cambridge Univ. Press 2007); JASANOFF, 1995, *supra* note 6, at 215-18.

was unsuccessful, the Inuit stories continue to receive international attention.[96]

As reported through the media, climate cases can teach the public about aspects of climate science and bring the scientific debates to a level that allows participation by the lay public. Courts play a significant role in how the public understands many scientific issues.[97] The ways that litigants present climate science and its inherent uncertainties, and the ways that courts respond, could affect public perceptions of the relevance, credibility, and legitimacy of climate experts and climate science. A better understanding of climate science, in turn, will help the public to appreciate the ethical, economic, social, and other implications of a changing climate. Climate litigation serves to enhance public understanding and stimulate debate on a wide variety of climate-related issues.

Chief Justice Roberts, writing in dissent in *Massachusetts v. EPA*, argued that the role of the courts is "not to serve as a convenient forum for policy debates."[98] While policy debate may not be the primary purpose of cases in litigation, such debate is the inevitable outcome in visible cases treating controversial issues such as climate change.

B. Advocacy for Political Action

Stories told through climate litigation may capture the public's imagination and trigger interest in change. Concerned citizens may press for political action to correct inequities and avoid or compensate for injuries, or for action to mitigate climate change or to support adaptation planning. Legislatures may take action in response to a court decision. Climate litigation could affect action at all levels, from local community decisions to international negotiations. Stimulating political action may be a prime motivator for some litigants.

In *Massachusetts v. EPA*, the Supreme Court has already recognized and legitimized claims that the global climate is changing, that human activities, including domestic automobile emissions, contribute significantly to the change, and that the "harms associated with climate change are serious and well recognized."[99] The press referred to the decision as a "rebuke to the Bush administration and its passive approach to the warming threat,"[100] and some translated it as a message to government to

96. Andrew C. Revkin, *World Briefing Americas: Inuit Climate Change Petition Rejected*, N.Y. TIMES, Dec. 16, 2007, at A1.

97. Richard C. Leone, *Foreword* to SHEILA JASANOFF, SCIENCE AT THE BAR: LAW, SCIENCE, AND TECHNOLOGY IN AMERICA, at ix (Harvard Univ. Press 1995).

98. 127 S. Ct. 1438, 1470 (2007) (Roberts, C.J., dissenting).

99. *Id.* at 1455.

100. Editorial, *The Court Rules on Warming*, N.Y. TIMES, Apr. 3, 2007, *available at* http://www.nytimes.com/2007/04/03/opinion/03tues1.html.

do something.[101] The media and NGOs across the political spectrum predicted that Congress was more likely to take action following the Supreme Court opinion.

Losing a climate-related case also may trigger political action. If states lose the right to regulate GHG emissions because of federal preemption, they are likely to pressure Congress to either put a strong legal framework in place at the federal level, or to allow states to legislate beyond federal standards. Corporations, if held legally responsible for their emissions, are likely to seek protection from liability from the federal government. Industry also may seek federal regulation in order to provide consistent national standards, and industry undoubtedly will try to influence the nature of such regulation.

CONCLUSION

Climate litigation provides a microcosm within which to study how society debates and reaches decisions about ethical, social, and other issues related to climate change. Litigants are bringing creative claims to the courts to force action on climate change, to block governmental action, and to hold entities responsible for climate-related injuries. The impact of climate litigation has just begun. Following plaintiffs' success in *Massachusetts v. EPA*, other parties are likely to file suit over climate issues, both in the U.S. and abroad. These cases show great promise for illuminating and possibly redressing some of the many ethical and social dimensions of climate change.

While litigants face daunting challenges to win their cases, the effects of climate litigation may be felt well beyond the courtroom, regardless of who wins in an individual case. Lawyers who are aware of these cases can help their clients plan for a changing climate and related legal challenges, but can also themselves participate more fully in the public debate about how society should respond to the challenges of our changing global climate.

101. Linda Greenhouse, *Justices Say E.P.A. Has Power to Act on Harmful Gases*, N.Y. TIMES, Apr. 3, 2007, at A5, *available at* http://www.nytimes.com/2007/04/03/washington/03scotus.html.

CLIMATE CHANGE, CONSTITUTIONAL CONSIGNMENT, AND THE POLITICAL QUESTION DOCTRINE

JAMES R. MAY†

ABSTRACT

Recently states and individuals have turned to federal common law causes of action to provide equitable and legal relief for climate change. Thus far, every federal court to consider these claims has held that they raise non-justiciable political questions consigned to the coordinate branches. These courts reason that federal courts lack jurisdiction over climate cases because climate change is textually committed elsewhere, there are no judicial standards to apply, and the elected branches have yet to render an initial policy determination about the subject. This article concludes that these courts either misapply or misapprehend the doctrine. It concedes that federal common law is not the optimal or only legal response to climate change. Yet it maintains that the political question doctrine is a false basis for dismissing climate cases that invoke these causes of action. The Constitution does not commit climate change to Congress or the executive. Federal common law provides ample and long-applied standards in cases involving disparate transboundary pollution. The elected branches have made initial policy determinations about climate change policies. Furthermore, there is good reason to question both the doctrine's jurisprudential bases and whether its framers meant it to be applied to federal common law in general, and climate cases in particular. Regardless, courts have rejected use of the doctrine to dismiss analogous claims for redress based on federal common law. The political question doctrine does not prevent courts from entering the climate change thicket.

> Whether Georgia by insisting upon this claim is doing more harm than good to her own citizens is for her to determine. The possible disaster to those outside the State must be accepted as a consequence of her standing upon her extreme rights.[1]

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1. Georgia v. Tennessee Copper Co., 206 U.S. 230 (1907) (Holmes, J.).

> The scope and magnitude of the relief Plaintiffs seek reveals the transcendently legislative nature of this litigation.[2]
>
> [The court] ought not inject itself into the global warming thicket.[3]

INTRODUCTION

Climate change, as Chief Justice Roberts observes in his dissenting opinion in *Massachusetts v. EPA*, "may be a crisis, even the most pressing environmental problem of our time."[4] The challenge it presents may be parts insurmountable and indifferent to political boundaries. It is not, however, indivisible. Its causes and effects are not equally distributed. It is caused much more by some than by others. While a global phenomenon, its costs are distributed unevenly, borne more acutely by the poor, the elderly, the infirm, and the politically disenfranchised.

The stakes are both tremendous and unknown, and transcendentally personal. Some have nowhere to turn but in despair and desperation to the federal courts, beckoning ossified causes of action. For example, on February 27, 2008, the tiny City of Kivalena and the Alaska Native Village of Kivalena—a federally recognized tribe—brought a federal lawsuit against a dozen petroleum refining, energy producing, and coal extracting companies.[5] They claim that the greenhouse gases these industries emit contribute to global climate change, causing them real, palpable, harm. Invoking the federal common law of public nuisance and other claims, they argue that these industries should pay the estimated $400 million it will cost to relocate the community lock, stock and barrel before it melts—schools, churches, streets, businesses, hospital, police and fire stations, community center, people and permafrost—into the Arctic Ocean.

What to do. Congress could force the energy, transportation and extractive sectors to change their ways or bare the economic externalities of their climate-altering activities. It could have them shoulder their fair share of the relocation, health care, property damage and other costs of climate change. States could do this too, subject to federal preemption.

It does not seem, however, that such measures are likely soon to come to pass. Congress has not enacted technology-forcing, damages-paying legislation to address climate change. Some states have picked up the slack with their own measures to reduce emissions of greenhouse

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2. Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 272 (S.D.N.Y. 2005).

3. California v. Gen. Motors Corp., No. 3:06-CV-05755 MJJ, 2007 WL 2726871, at *29 (N.D. Cal. Sept. 17, 2007).

4. Massachusetts v. EPA, 127 S. Ct. 1438, 1463 (2007) (Roberts, C.J., dissenting) (internal quotations omitted).

5. *See Climate Change Threatens Existence, Eskimo Lawsuit Says*, CNN, Feb. 27, 2008, *available at* http://www.cnn.com/2008/WORLD/americas/02/26/us.warming.ap/index.html.

gases, promote conservation or alternative energy and transportation, and create markets in hopes of reducing carbon output. Yet states are left with little means either to mandate engineering responses or to be reimbursed for response costs.

The costs to states and individuals for responding to climate change, including that for health care, community relocation, property damage, shoreline loss, and technical assistance, to name a few, will likely be unlike anything we have seen in kind or degree. Whatever uncertainties about costs exist, however, one prediction seems an even bet: States and individuals will be left both with the dinner bill and the dirty dishes for the vestiges of a party-hard century of unsustainable carbon output.

Enter the common law. Public nuisance theory allows states and individuals to seek injunctive relief and/or money damages to abate activities that unreasonably interfere with a right common to the general public. Yet state public nuisance causes of action are often curtailed by limitations on liability and statutes of limitations, by requirements for individuals to show special damages, and by other obstacles.

Enter the federal common law. Since the time Justice Holmes sat on the Court, federal common law for public nuisance has served as a meaningful cause of action for states and individuals to stop harmful activities and recover the costs of transboundary pollution. So too it can with climate change. Indeed, the legal challenges of climate change seem a particularly cozy fit for federal common law. It is transboundary. Legislative enactments allowing for injunctive relief or money damages do not exist. A patchwork of state common law responses is untenable. So one is left to wonder for what federal common law can exist if not for climate change. And if current circumstances concerning climate change do not warrant its use, then when possibly could it be so.

Thus, states representing almost one-half of the nation's citizenry have brought federal common law public nuisance causes of action against the world's largest auto manufacturing[6] and fossil fuel burning energy companies.[7] Cities and tribes—as in Kivalena—have followed suit. Private litigants have also brought federal common law nuisance actions for damages caused or complicated by climate change.[8]

Enter the political question doctrine. It aims to thwart the judicial review of issues textually or prudentially consigned to Congress, the

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6. *Gen. Motors*, 2007 WL 2726871, at *16. Randall S. Abate, *Automobile Emissions and Climate Change Impacts: Employing Public Nuisance Doctrine as Part of a "Global Warming Solution" in California*, 40 CONN. L. REV. 591, 598 (2008) [hereinafter *Automobile Emissions*].

7. *Am. Elec. Power Co.*, 406 F. Supp. 2d at 274.

8. Comer v. Murphy Oil USA, Inc., No. 1:05-CV-436-LG-RHW, 2006 WL 1066645, at *2 (S.D. Miss. Aug. 30, 2007) (dismissing under the political question doctrine private common law cause of action brought by individuals to address effects of climate change), *appeal docketed*, No. 07-60756 (5th Cir. 2007).

President, or both.[9] The doctrine's political philosophy is "essentially a function of the separation of powers"[10] rooted in Jeffersonian notions of constitutional theory that democracy is best served by having coordinate elected branches resolve political questions rather than politically unaccountable federal judges.[11] To coin a phrase, the doctrine applies to disable federal courts from reviewing matters on the theory that they "ought not enter [the] political thicket."[12]

Enter the courts. Expressly declining to "enter the global warming thicket," federal courts have thus far invoked the political question doctrine to dismiss federal common law causes brought by states and individuals for climate change. This means that the cause of action is dead on arrival. There is no answer, no discovery, no standing, no proof, and no opportunity to prove damages or "unreasonable" harm. Exit the case.

Enter a preemptive clarification and concession. First, this article does not argue that federal courts in the United States are the premier forum for addressing what is arguably the world's most pressing problem. It does not aim to diminish the role of international fora, Congress, the President, agencies, the States, and citizens. The operative question here is whether the political question doctrine prevents federal courts from hearing climate cases rooted in federal common law. This article concludes it does not.

Second, this article is not an aria apologia on behalf of federal common law to address climate change. Federal common law is unwieldy and amorphous. To be sure, describing it is a little like describing what Mozart's opera *Magic Flute* tastes like. Federal common law is hardly the only or most efficient societal response to climate change.

But a vital response it is. Climate cases, if they are to fall, should fail on other ground, say, because the plaintiffs fail to prove damages are "unreasonable," or because they yield to other constitutional features. Indeed, state and private responses to climate change raise a constellation of other, arguably more substantial, constitutional questions. These include those under the Supremacy,[13] dormant Commerce[14] and Foreign

9. *See* Baker v. Carr, 369 U.S. 186, 210-27 (1962) (thoroughly discussing the political question doctrine).

10. U.S. Dep't of Commerce v. Montana, 503 U.S. 442, 456 (quoting *Baker*, 369 U.S. at 217).

11. *See id.*

12. Colegrove v. Green, 328 U.S. 549, 556 (1946).

13. U.S. CONST. art. VI, cl. 2. For assessment of preemption and climate issues, see generally Ann E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 U.C. DAVIS L. REV. 281 (2003); Sara A. Colangelo, Comment, *The Politics of Preemption: An Application of Preemption Jurisprudence and Policy to California Assembly Bill 1493*, 37 ENVTL. L. 175 (2007); Sarah Olinger, Comment, *Filling the Void in an Otherwise Occupied Field: Using Federal Common Law to Regulate Carbon Dioxide in the Absence of a Preemptive Statute*, 24 PACE ENVTL. L. REV. 237 (2007).

14. U.S. CONST. art. I, § 8, cl. 3. For an analysis of how the dormant Commerce Clause and dormant Foreign Relations Clause apply to California's recent climate legislation, see generally Erwin Chemerinsky et al., *California, Climate Change, and the Constitution*, 37 ENVTL. L. REP.

Relations,[15] Compact[16] and Treaty[17] clauses, and standing.[18] Each provides more constitutionally legitimate application to climate cases than does the political question doctrine.

This article summarizes and evaluates the growing body of jurisprudence relating to how the political question doctrine applies to federal common law causes of action that address the causes and effects of climate change. Part I provides an overview of the effects of and policies toward climate change, and the role federal common law might play in addressing them. Part II discusses the political question doctrine's origins and legal architecture. Part III describes juridical applications of the "textual commitment" prong of the doctrine and explains why it does not apply to climate cases. Part IV examines how courts have applied the prudential component of the doctrine and explains why these too do not apply in climate cases. Part V questions whether applying the political question doctrine to climate cases is constitutionally legitimate and whether it was designed to apply to federal common law in general, and climate cases in particular.

This article concludes that federal courts have thus far incorrectly invoked the political question doctrine in climate cases under federal common law. This erroneously foreclososes consideration of any other factual, causal, constitutional, statutory, common law, or remedial issues out of undue deference to the elected branches of the federal government.

10653 (2007); Peter Carl Nordberg, Note, *Excuse Me, Sir, But Your Climate's on Fire: California's S.B. 1368 and the Dormant Commerce Clause*, 82 NOTRE DAME L. REV. 2067 (2007).

15. *See generally* Hannah Chang, *Foreign Affairs Federalism: The Legality of California's Link with the European Union Emissions Trading Scheme*, 37 ENVTL. L. REP. 10771 (2007) (discussing the dormant foreign affairs power and California's efforts to combat climate change). Some question the existence of foreign-affairs preemption. *See, e.g.*, Thomas W. Merrill, *Global Warming as a Public Nuisance*, 30 COLUM. J. ENVTL. L. 293, 327-28 (2005) ("If the mere appearance of an issue on the international agenda would result in automatic preemption of state authority under the dormant foreign affairs preemption, a good deal of the police powers of the States would become at risk.").

16. U.S. CONST. art. I, § 10, cl. 3. For a discussion of the interplay between the Compact Clause and multi-state agreements to address the effects of climate change, see generally Katie Maxwell, Comment, *Multi-State Environmental Agreements: Constitutional Violations or Legitimate State Coordination?* 15 PENN. ST. ENVTL. L. REV. 355 (2007); Michael S. Smith, Note, *Murky Precedent Meets Hazy Air: The Compact Clause and Regional Greenhouse Gas Initiative*, 34 B.C. ENVTL. AFF. L. REV. 387 (2007).

17. U.S. CONST. art I, § 10, cl. 1; *id.* art. II, § 2, cl. 2. *See generally* Kirk Junker, *Conventional Wisdom, De-Emption and Uncooperative Federalism in International Environmental Agreements*, 2 LOY. U. CHI. INT'L L. REV. 93 (2005) (discussing the Treaty Clauses, states' rights, and international environmental agreements). For broader commentary on international agreements and federalism, see generally Robert J. Delahunty, *Federalism Beyond the Water's Edge: State Procurement Sanctions and Foreign Affairs*, 37 STAN. J. INT'L L. 1 (2001); Edward T. Swaine, *Does Federalism Constrain the Treaty Power?*, 103 COLUM. L. REV. 403 (2003); Edward T. Swaine, *Negotiating Federalism: State Bargaining and the Dormant Treaty Power*, 49 DUKE L.J. 1127 (2000).

18. For an overview of standing principles raised in climate litigation, see generally Bradford C. Mank, *Standing and Global Warming: Is Injury to All Injury to None?*, 35 ENVTL. L. 1 (2005); Nigel Cooney, Note, *Without a Leg to Stand On: The Merger of Article III Standing and the Merits in Environmental Cases*, 23 WASH. U. J.L. & POL'Y 175 (2007).

Thus, while conceding that federal common law causes of action do not provide an optimal democratic, economic or societal means to address the effects of climate change, this article concludes that the political question doctrine is an unworkable constitutional means for dismissing climate cases planted in federal common law. The doctrine does not prevent federal courts from entering this thicket.

I. CLIMATE CHANGE, POLICY, AND THE ROLE OF FEDERAL COMMON LAW

A lengthy discussion of the root causes and effects of climate change and attendant policies is beyond the scope of this article. It is, however, helpful to recapitulate them briefly before describing how federal common law might apply.

A. Effects of Climate Change

Climate Change is at least somewhat attributable to anthropogenic greenhouse gas (GHG) emissions from the use and combustion of fossil fuels.[19] Extracted from underground sources derived from the decomposition of plants and animals that lived and died millions of years ago, fossil fuels (e.g., coal, petroleum, natural gas) have become an indispensable component of life in the western world. We use fossil fuels to propel our cars, planes and trains; to heat our homes, hospitals, schools and businesses; to make fabrics, plastics and pharmaceuticals; and to provide the majority of the power we use to wash our clothes and dishes, keep the lights on, charge our phones and other electronics, run our computers, and live our modern lives.

The fossil fuels used to facilitate these activities produce copious amounts of GHGs. Indeed, over the time it takes for you to read this article (assuming you are an average reader with above-average patience), human activity will contribute about another three million tons of GHGs into the atmosphere, further concentrating GHG levels.[20]

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19. A comprehensive discussion of the evidence surrounding anthropogenic-induced climate change is beyond the scope of this article. For this, the reader is referred to Chapter 1 of the Stern Review from the British government. *See generally* SIR NICHOLAS STERN, STERN REVIEW ON THE ECONOMICS OF CLIMATE CHANGE (2006), *available at* http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm.

20. *See* Donald A. Brown, *The U.S. Performance in Achieving Its 1992 Earth Summit Global Warming Commitments*, 32 ENVTL. L. REP. 10, 741 (2002). Many scientists and policy makers believe that a doubling of CO_2 from preindustrial levels to 560 ppm may be unavoidable in the 21st century. This is so because the world's political and economic system cannot respond rapidly enough to make faster changes in some major polluting sources such as gasoline-powered automobiles or coal fired power plants. Some environmentalists, however, believe it is still possible to stabilize GHG at 450 ppm, a level that would limit the temperature increase (in addition to that

The increase in GHGs courts calamity by contributing to global climate change.[21] Future generations will be saddled with the costs of "doing nothing."[22] As the Supreme Court recently observed, "[t]he harms associated with climate change are serious and well recognized,"[23] potentially including "a precipitate rise in sea levels by the end of the century, . . . 'irreversible changes to natural ecosystems,' a 'significant reduction in water storage in winter snowpack in mountainous regions. . . ,' and an increase in the spread of disease."[24]

The effects of climate change are distributed disproportionately. It is expected to increase precipitation in the Americas, but decrease it in southern Africa, the Mediterranean and southern Asia.[25] Relative ground temperatures are expected to rise faster in the polar regions, particularly in the Arctic Regions.[26]

The manifestations of climate change are difficult to ignore. Indeed, as former Vice President Al Gore explained when accepting the Nobel Peace Prize for his extensive work on spreading the news about the dangers of climate change:

> In the last few months, it has been harder and harder to misinterpret the signs that our world is spinning out of kilter. Major cities in North and South America, Asia and Australia are nearly out of water due to massive droughts and melting glaciers. Desperate farmers are losing their livelihoods. Peoples in the frozen Arctic and on low-lying Pacific islands are planning evacuations of places they have long called home. Unprecedented wildfires have forced a half million people from their homes in one country and caused a national emergency that almost brought down the government in another. Climate refugees have migrated into areas already inhabited by peo-

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which has already been caused by human activities) to 1.5 to 2°F during the next 100 years. Virtually nobody believes that it is possible to stabilize atmospheric concentrations below 450 ppm and concentrations could continue growing after that if third-world countries do not implement aggressive reduction strategies, even if the most ambitious proposal currently under consideration were adopted. *Id.*

21. For a discussion of some of the impacts of climate change, see generally Richard A. Kerr, *Latest Forecast: Stand By for a Warmer, but not Scorching, World*, SCIENCE, Apr. 21, 2006, *available at* http://www.sciencemag.org/cgi/content/full/312/5772/351a; CAMILLE PARMESAN & HECTOR GALBRAITH, PEW CENTER ON GLOBAL CLIENT CHANGE, OBSERVED IMPACTS OF GLOBAL CLIMATE CHANGE IN THE U.S. (2004), *available at* http://www.pewclimate.org/docUploads/final_ObsImpact.pdf. For contemporaneous impacts, see generally Real Climate: Climate Science from Climate Scientists, http://www.realclimate.org (last visited Mar. 26, 2008).

22. Robert L. Glicksman, *Global Climate Change and the Risks to Coastal Areas from Hurricanes and Rising Sea Levels: The Costs of Doing Nothing*, 52 LOY. L. REV. 1127, 1127, 1179 (2006).

23. Massachusetts v. EPA, 127 S. Ct. 1438, 1455 (2007).

24. *Id.* at 1456 (quoting declaration of Michael MacCracken, former Executive Director, U.S. Global Change Research Program).

25. This harm also translates into economic costs. *See* Gateway to the United Nation's Systems on Climate Change, Climate Change at a Glance, http://www.un.org/climatechange/background/ataglance.shtml (last visited Mar. 26, 2008).

26. *See* Gateway to the United Nation's Systems on Climate Change, *supra* note 25.

> ple with different cultures, religions, and traditions, increasing the potential for conflict. Stronger storms in the Pacific and Atlantic have threatened whole cities. Millions have been displaced by massive flooding in South Asia, Mexico, and 18 countries in Africa. As temperature extremes have increased, tens of thousands have lost their lives. We are recklessly burning and clearing our forests and driving more and more species into extinction. The very web of life on which we depend is being ripped and frayed.[27]

The *status quo* will increase GHG emissions about two percent per annum, resulting in a global increase of at least two to three degrees Celsius by 2100.[28] It will also likely bring about abrupt climate change. This includes ice sheet disintegration, and regional climate disruptions.[29] Furthermore, it is likely to result in significant species loss because isotherm displacement due to climate change moves more rapidly than plants and animals can migrate.[30] The domestic effects of climate change include extreme weather events and more significant droughts, floods, and fires.[31] States in the United States have already reported rising sea levels, flooding, snowfall reductions, and coastal erosion.[32] They are also left with health care and other costs in the aftermath.[33]

B. Policy Responses

A conspicuous lack of cohesive federal action to regulate greenhouse gas emissions has invited piecemeal approaches to climate change in the U.S.[34] In 1992, the United States joined the U.N. Framework Convention on Global Climate Change (UNFCC). In 1997, it served as a signatory to the Kyoto Protocol on Global Climate Change. Yet subsequently the political branches and federal agencies have said much and done relatively little to address climate change.

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27. Al Gore, Nobel Peace Prize Acceptance Speech (Dec. 10, 2007), *available at* http://nobelprize.org/nobel_prizes/peace/laureates/2007/gore-lecture_en.html.

28. Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295, 340 (D. Vt. 2007); *see also* Central Valley Chrysler-Jeep, Inc. v. Witherspoon, 2007 WL 135688 (E.D. Cal. 2007), 456 F. Supp. 2d 1160 (E.D. Cal. 2006) (companion case challenging California standards); Lincoln Dodge, Inc. v. Sullivan, 1:06-cv-00070-T-LDA (filed Feb. 13, 2006) (same for Rhode Island).

29. *Crombie*, 508 F. Supp. 2d at 340.

30. *Id.* at 340-41.

31. *See, e.g., id.* at 341. Hansen Aff., Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, Nos. 2:05-CV-302, 2:05-CV-304, 2006 WL 4761053, at ¶ 65 (D. Vt. Aug. 14, 2006).

32. *See, e.g.*, GUIDO FRANCO, CALIFORNIA ENERGY COMMISSION, CLIMATE CHANGE IMPACTS AND ADAPTATION IN CALIFORNIA 7 (2005), *available at* http://www.energy.ca.gov/2005publications/CEC-500-2005-103/CEC-500-2005-103-SD.PDF; Washington State, Department of Ecology, http://www.ecy.wa.gov/climatechange/effects.htm (last visited Mar. 26, 2008).

33. *See,* Lisa Heinzerling, *Climate Change, Human Health, and the Post-Cautionary Principle*, 96 GEO. L.J. 445, 445-60 (2008).

34. Randall S. Abate, *Kyoto or Not, Here We Come: The Promise and Perils of the Piecemeal Approach to Climate Change Regulation in the United States*, 15 CORNELL J. L. & PUB. POL'Y 369, 372 (2006).

First, Congress. While many federal representatives lend their name to pending climate legislation, Congress has yet to enact any of it.[35] The U.S. Senate has yet to ratify the Kyoto Protocol. With Australia's late 2007 ratification of the Protocol,[36] this leaves the U.S. with the dubious distinction of being the only major industrialized country in the world that has not done so.[37] Moreover, Congress has not allocated or appropriated funds to pay for the direct effects of climate change. These include shoreline loss, property damage, crop diminution, and personal health and welfare loss and injuries.

Next, the Executive. The President has done little to enter the climate change fray other than promote volunteerism. While the Bush Administration observes that global climate change is a "complex and important issue,"[38] it regularly resists federal measures to regulate GHG emissions. When countries from around the globe met in Bali in the fall of 2007 to discuss ways to reduce GHG emissions, primarily as a means of protecting the poor and politically powerless around the globe,[39] the White House announced that it would not agree to reduce U.S. greenhouse gas emissions.[40]

The Fourth Branch has fared no better. Federal agencies have adopted a "wait and see" approach exalting voluntary community action. While the U.S. Environmental Protection Agency (EPA) allows that "human-induced warming and associated sea level rises are expected to continue through the 21st century,"[41] it has avoided opportunities to regulate GHG emissions under available legislative vehicles, such as the Clean Air Act, despite prodding by the U.S. Supreme Court.[42] It has also failed to recommend legislative action.

Furthermore, EPA has thwarted innovative state measures to address climate change. For example, on December 19, 2007, EPA Chief Administrator Johnson denied the State of California's petition[43] to regu-

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35. *See, e.g.*, America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007), *available at* http://usclimatenetwork.org/federal/lieberman-warner-bill/ACSA.pdf; Low Carbon Economy Act of 2007, S. 1766, 110th Cong. (2007); Global Warming Reduction Act of 2007, S. 485, 110th Cong. (2007).

36. *Australia Ratifies Kyoto Protocol*, N.Y. TIMES, Dec. 3, 2007, *available at* http://www.nytimes.com/2007/12/03/world/asia/03rudd-wire.html.

37. Abate, *supra* note 34, at 370-72.

38. The White House, Council on Environmental Quality, http://www.whitehouse.gov/ceq/global-change.html (last visited Mar. 26, 2008).

39. Peter Gelling, *Focus of Climate Talks Shifts to Helping Poor Countries Cope*, N.Y. TIMES, Dec. 13, 2007, at A31.

40. *See* Chemerinsky et al., *supra* note 14, at 10662.

41. ENVIRONMENTAL PROTECTION AGENCY, CHAPTER 6, IMPACTS AND ADAPTATION 1, *available at* http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/SHSU5BNQ7Z/$File/ch6.pdf (last visited Mar. 26, 2008).

42. *See* Robert S. Glicksman, *Balancing Mandate and Discretion in the Institutional Design of Federal Climate Change Policy*, 102 NW. U. L. REV. 196, 201-02 (2008).

43. California Environmental Protection Agency Air Resources Board, Request for a Clean Air Act Section 209(b) Waiver Preemption for California's Adopted and Amended New Motor

late greenhouse gas emissions from new automobiles.[44] In a curious call,[45] EPA maintains that California has failed to demonstrate the "compelling and extraordinary circumstances" needed to enact such regulations.[46] California immediately objected[47] and has filed suit,[48] joined by fifteen other states,[49] to reverse the EPA's ruling.[50] EPA then waited another three months before formally rejecting the State of California's request to regulate GHG emissions from new motor vehicles.[51]

The vacuum left by the lack of coherent federal action has resulted in an ad-hoc "dynamic federalism."[52] Think of it as the Wild West meets political climate science, where sub global regulation runs amok.[53]

Alas, the states. States frustrated with the lack of action by the elected federal branches have turned to other mechanisms to address climate change.[54] Take your pick. State measures include gubernatorial action,[55] legislation, regulation,[56] and multistate climate change com-

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Vehicle Regulations and Incorporated Test Procedures to Control Greenhouse Gas Emissions: Support Document, December 21, 2005.

44. Letter from Stephen L. Johnson, Administrator, EPA, to Arnold Schwarzenegger, Governor, California, denying Section 209(b) waiver preemption (Dec. 19, 2007), *available at* http://www.epa.gov/otaq/climate/20071219-slj.pdf.

45. Glicksman, *supra* note 22, at 201-02.

46. *Id.*; *see also* Johnson, *supra* note 44.

47. Letter from Arnold Schwarzenegger, Governor, California, and 13 Other Governors to Stephen L. Johnson, Adminstrator, EPA, regarding U.S. EPA's denial of California's tailpipe emissions waiver request (Jan. 23, 2008), *available at* http://gov.ca.gov/press-release/8596/ ("The federal government, with this unprecedented action, is ignoring the rights of states, as well as the will of more than one hundred million people across the U.S.").

48. *See* California v. U.S. Envtl. Prot. Agency, No. 08-70011 (9th Cir. filed Jan. 2, 2008).

49. Fifteen states have joined the suit, on the basis of § 177. Keith Richburg, *California Sues EPA Over Emissions Rules*, WASH. POST, Jan. 3, 2008, at A02, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2008/01/02/AR2008010202833.html.

50. Office of the Governor, Governor Schwarzenegger Announces EPA Suit Filed to Reverse Waiver Denial, *available at* http://gov.ca.gov/press-release/8400/ (suit filed in Ninth Circuit on January 2, 2008); California Sues EPA over Greenhouse Gas Rules, MSNBC, Jan. 2, 2008, *available at* http://www.msnbc.msn.com/id/22474944/ (arguing EPA ignored legal requirements of CAA).

51. California State Motor Vehicle Pollution Control Standards: Notice of Decision Denying a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 73 Fed. Reg. 12,156 (Mar. 26, 2008).

52. Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159, 177 (2006).

53. *See, e.g.*, Kirsten H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 ECOL. L.Q. 183, 194, 196-97 (2005).

54. For discussions of recent state efforts, see Daniel A. Farber, *Climate Change, Federalism, and the Constitution* 2-3 (U.C. Berkeley Public Law Research, Paper No.1081664, 2008), *available at* http://ssrn.com/abstract=1081664; Alice Kaswan, *The Domestic Response to Global Climate Change: What Role for Federal, State, and Litigation Initiatives?*, 42 U.S.F. L. REV. 39, 46 (2007).

55. Sarah Krakoff, *Essay: Arnold Schwarzenegger and Our Common Future*, 53 BUFF. L. REV. 925, 925 (2005).

56. *See* Farber, *supra* note 54, at 31. Professor Farber states:

> Courts should not be quick to invalidate state climate regulations, whether or not Congress has legislated. It is much more likely that society will be too timid in responding to climate change than that it will go too far; any fear of over-regulation by states would be largely misplaced. The courts should consequently content themselves with policing against the most obvious potential flaws in state legislation.

Id. at 4.

pacts.[57] Last, states have looked to federal courts for help, summoning the federal common law.

C. Role of Federal Common Law

Impatient with the general lack of federal action,[58] and concerned about the effects of climate change, states representing nearly one-half of the nation's population and individuals have brought a significant amount of litigation to address climate change.[59] Aiming for compensation,[60] or pushing technological responses, states, communities and individuals have turned to the federal common law of public nuisance.[61]

Public nuisance law involves an "unreasonable interference with a right common to the general public."[62] Public nuisance cases are generally brought by public entities, such as states as *parens patriae*, to protect state resources and the interests of a state's citizens.

The theory is relatively straightforward. The linchpin of a federal public nuisance cause of action is establishing that the interference is "unreasonable" to public health or welfare.[63] Causation for public nuisance can be collective. Any defendant that plays a substantial role in

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57. Kirsten H. Engel, *Mitigating Global Climate Change in the United States: A Regional Approach*, 14 N.Y.U. ENVTL. L.J. 54, 65 (2005); Memorandum of Understanding on the Regional Greenhouse Gas Initiative from the Governors of the States of CT, DE, ME, NH, NJ, NY, and VT (Dec. 20, 2005), *available at* http://www.rggi.org/docs/mou_final_12_20_05.pdf (capping GHGs from, and agreeing to cooperate with carbon markets for, electric utilities).

58. Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 WAKE FOREST L. REV. 719, 778 (2006).

59. *See* ROBERT MELTZ, CLIMATE CHANGE LITIGATION: A GROWING PHENOMENON 5, 14, 18, 22 (2007), *available at* www.ncseonline.org/NLE/CRSreports/05jan/RL32764.pdf; *see also* JUSTIN R. PIDOT, GLOBAL WARMING IN THE COURTS: A LITIGATION UPDATE 1 (2006), *available at* http://www.law.georgetown.edu/gelpi/current_research/documents/GWL_Report.pdf.

60. *See* Daniel Farber, *Basic Compensation for Victims of Climate Change*, 155 U. PA. L. REV. 1605, 1613-14 (2007). In advancing ideas about how to compensate for climate change, Professor Farber writes:

> My purpose is not to offer a fully matured blueprint for compensation. It is to put some basic ideas on the table and to suggest that at least part of the compensation issue is relatively manageable. In the end, the decision of whether to compensate will be driven largely by political decision makers rather than by courts or, even less likely, by scholars. Whether a large-scale compensation plan will ever be adopted, let alone when such a step might be taken, remains unclear. Even at this early stage, however, it is useful to imagine the outlines of a compensation scheme. Doing so may help focus the debate on whether or not to compensate, and it will provide a useful head start on actual programmatic design if the decision is ultimately made to provide compensation.

Id. at 1608.

61. *See* Kaswan, *supra* note 54, at 52 ("I suggest that the courts remain a vital forum for addressing climate change, particularly in the absence of comprehensive action by the other branches of government."). For other potential remedies, see Denise E. Antolini & Clifford L. Rechtschaffen, *Common Law Remedies: A Refresher*, 38 ENVTL. L. REP. 10114, 10127 (2008).

62. RESTATEMENT (SECOND) OF TORTS § 821B (1979).

63. *See* Thomas W. Merrill, *Global Warming as a Public Nuisance*, 30 COLUM. J. ENVTL. L. 293, 328-30 (2005) (explaining how courts balance equities in public nuisance cases); Matthew F. Pawa & Benjamin A. Krass, *Global Warming as a Public Nuisance:* Connecticut v. American Electric Power, 16 FORDHAM ENVTL. L. REV. 407, 448-49 (2005) (discussion of elements of public nuisance cause of action).

causing the nuisance can be liable.[64] A plaintiff's ability to demonstrate causation will depend upon the significance of each defendant's contributions. When the harm is indivisible, liability for public nuisance is joint and several.[65] In the climate context, it is plausible to find that a defendant is a significant contributor to an unreasonable interference with a right common to the general public and allocate responsibility for equitable or legal relief.[66]

Federal common law for public nuisance has a long and storied history of helping to fill the interstitial regulatory gaps left by diluted or dilatory federal legislative and executive responses. There is thus a rich history of cases applying federal common law to transboundary pollution in the face of insufficient federal regulation.[67] The more venerated, if not necessarily household name cases, include *Illinois v. City of Milwaukee*[68] and *Missouri v. Illinois*[69] (water pollution), *New Jersey v. New York*[70] (solid waste), and *Georgia v. Tennessee Copper Co.*[71] (air pollution).

Federal common law holds potential for addressing the effects of climate change, even if it is "second best" to other legislative and judicial responses. As Professor Kaswan notes:

> [T]he common law provides a legal remedy for a serious injury that the political branches have failed to provide. Common law actions could also create political pressure for needed congressional action. Moreover, the climate change public nuisance cases brought to date do not pose as great a risk of piecemeal and inconsistent standards as common law cases sometimes pose. The courts' relative institutional competence, from both a technical and a political perspective, is a concern, and one that suggests that a legislative approach would ultimately be preferable. Nonetheless, in the absence of a legislative response, the common law's "second best" is better than nothing.[72]

Since the nation's founding the common law has afforded the means for states and citizens to stop or curtail harmful and insufficiently-regulated activities and to recover demonstrable personal and property damages. Hence states and citizens have turned to the federal common law to address unreasonable effects of cigarettes, weapons, insurance

64. Pawa & Krass, *supra* note 63, at 450-55 (discussing liability of defendants whose contributions alone would not have created the nuisance).

65. David A. Grossman, *Warming up to a Not-So-Radical Idea: Tort-Based Climate Change Litigation*, 28 COLUM. J. ENVTL. L. 1, 31 (2003).

66. *See id.* at 27.

67. Joel Franklin Brenner, *Nuisance Law and the Industrial Revolution*, 3 J. LEGAL STUD. 403, 421 (1974).

68. 406 U.S. 91 (1972).

69. 200 U.S. 496 (1906).

70. 284 U.S. 585 (1931).

71. 206 U.S. 230 (1907).

72. Kaswan, *supra* note 54, at 106.

fraud and price gouging, as well as for the transboundary effects of air emissions, water pollution and contamination of land and drinking water.

Federal common law provides a means for addressing the impacts of climate change in three ways. First, it offers the opportunity to establish compliance schedules to require the installation of technology that might be used to reduce emissions of GHGs. Second, it provides a basis for compensation for personal or property damage.[73] Third, it provides a means for paying the costs of monitoring, protecting, restoring, or providing substitutes for existing resources.[74]

Federal common law is specially suited to remedy the personal and property parade of climate change horribles. When Congress inevitably enters the fray and enacts pervasive climate legislation, it is unlikely to set aside a remedial fund to pay states, cities and citizens who will absorb the externalized costs of GHG emissions of the auto, industrial and energy sectors. The tea leaves suggest that when Congress acts it is unlikely to do so in a fashion that gives states and citizens much latitude in controlling measures or damages. Rather, it is more likely to install a "cap and trade" market in which regulated entities are allocated and can acquire and trade emission credits and perhaps enjoy partial or full immunity from private law causes of action, if not liability limits for compensatory or punitive damages. It is also likely that Congress will explicitly if not implicitly preempt federal common law causes of action for injunctive relief, and maybe for damages too. It may also preempt state common law causes of action in the same regard.

There is little doubt that federal common law is hardly the optimal option for addressing climate change. Climate change is a global issue with salient national impacts. The elected branches are well suited to weigh the tough policy choices about energy, conservation, transportation, and a host of other factors. The states no doubt have a role in implementing climate policy in a grand dance of cooperative federalism.

Yet equally doubtful is the elected branches' capability to provide the legislative and tactical relief due states and individuals for the adverse effects of climate change. The effects of climate change come with a price tag, one that is regressive for states and citizens, including those on the political and economic margins of society.[75] Adverse effects include ice-melt sea level rise that would inundate the East Coast of the

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73. For a discussion of a possible framework for compensating the victims of climate change, see generally Farber, *supra* note 54.

74. *Id.* at 1655.

75. *See also* Ruth Gordon, *Climate Change and the Poorest Nations: Further Reflections on Global Inequality*, 78 U. COLO. L. REV. 1559, 1624 (2007); Rebecca Tsosie, *Indigenous People and Environmental Justice: The Impact of Climate Change*, 78 U. COLO. L. REV. 1625, 1677 (2007). *See generally* Alice Kaswan, *supra* note 54 (providing an overview of the positive and negative environmental justice implications of a variety of the most significant emerging climate change policies, including cap and trade).

U.S., including most of Florida and most urban centers heavily populated by racial and ethnic minorities.[76]

The price tag for climate change is daunting. Massachusetts alone concludes that climate change will cost its taxpayers $1.8 billion annually due to increased flooding, loss of shoreline, and water borne diseases.[77] Climate change will also place some states at a competitive disadvantage.[78] Hence states, their instruments, and individuals are left wondering why they should be left to pay for climate change.[79]

Almost as last resort then they have enlisted the federal judiciary to help fashion relief under the federal common law. These cases naturally involve a complex intersection of foreign, federal and state law and policy. They also raise myriad constitutional questions, including whether the "political question doctrine" prevents federal courts from exercising jurisdiction over climate cases, as discussed in Part II. This article concludes it does not.

II. THE POLITICAL QUESTION DOCTRINE

While the Constitution does not admit of a field of "political questions" beyond the reach of the federal judiciary, the Supreme Court has concluded that matters that are demonstrably committed to a coordinate branch of government, or otherwise imprudent for judicial service, are not justiciable.[80]

Chief Justice Marshall's observations serve as the fountainhead of the doctrine. In *Marbury v. Madison*,[81] he wrote that there are "irksome" and "delicate" questions that are inherently political and out of reach to the federal judiciary: "Questions, in their nature political or which are, by the Constitution and laws, submitted to the executive can never be made to this court."[82] Thus, he anticipated two strands of cases that engender judicial forbearance, and with them, the framework of the political question doctrine: first, those that are constitutionally or statutorily

76. Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie, 508 F. Supp. 2d 295, 340 (D. Vt. 2007).

77. *See also* Massachusetts v. EPA, 127 S. Ct. 1438 (2007).

78. *See* Barry G. Rabe, Mikael Román & Arthur N. Dobelis, *State Competition as a Source Driving Climate Change Mitigation*, 14 N.Y.U. ENVT. L.J. 1, 45 (2005) (state litigation "is a flexible tool for overcoming regulatory inertia at the federal level").

79. *See* Daniel A. Farber, *Adapting to Climate Change: Who Should Pay?*, 23 J. LAND USE & ENVTL. L. 1, 2-3 (2007). Professor Farber says:

> Most importantly, we should start thinking about cost allocation now because very soon the world is going to start doing so. As the realization sinks in that climate change will cause billions of dollars of harm even if we do everything feasible to cut back on emissions, the people who are directly harmed are going to start wondering whether they alone should bear the costs.

Id. at 4.

80. Baker v. Carr, 369 U.S. 186, 198-204 (1962).

81. 5 U.S. 137 (1803).

82. *Id.* at 169-70.

committed to the executive branch and second, those that as a matter of prudence should be avoided because they are political "in their nature."[83]

Modern political question jurisprudence inquires as to "whether the duty asserted can be judicially identified and its breach judicially determined, and whether protection for the right asserted can be judicially molded."[84] In deciding whether to apply the doctrine, courts must "analyze representative cases and . . . infer from them . . . analytical threads."[85] Such threads expose six "formulations" of cases that are not suitable for judicial identification, determination or molding:

> (1) a textually demonstrable constitutional commitment of the issue to a coordinate political department; or (2) a lack of judicially discoverable and manageable standards for resolving it; or (3) the impossibility of deciding without an initial policy determination of the kind clearly for nonjudicial discretion; or (4) the impossibility of a court's undertaking independent resolution without expressing lack of the respect due coordinate branches of the government; or (5) an unusual need for unquestioning adherence to a political decision already made; or (6) the potentiality of embarrassment from multifarious pronouncements by various departments on one question.[86]

The formulations are "probably listed in descending order of both importance and certainty."[87] Yet dismissal is warranted only if one of these formulations is "inextricable" from the case.[88]

Baker v. Carr's formulations reveal the two strands of the political question doctrine. The first strand—which encompasses the first formulation—is textual, and asks whether commitment of the issue to an elected branch is "[p]rominent on the surface."[89] The second strand—which includes formulations (2) through (6)—is prudential, and applies in the absence of a textual commitment but when there are functional reasons for judicial restraint.[90]

The political question doctrine has proven one of "limited application."[91] Applying the doctrine involves "a delicate exercise in constitutional interpretation" to be conducted on a "case-by-case inquiry."[92] It is to be used sparingly in the context of demonstrable "political questions" devoted to the elected branches, not simply to cases that involve political

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83. *Id.* at 170.
84. *Baker*, 369 U.S. at 198.
85. *Id.* at 211.
86. *Id.* at 217.
87. Vieth v. Jubelirer, 541 U.S. 267, 278 (2004).
88. *Baker*, 369 U.S. at 217.
89. *Id.*
90. *Id.*
91. *See* Barasich v. Columbia Gulf Transmission Co., 467 F. Supp. 2d 676, 681 (E.D. La. 2006).
92. *Baker*, 369 U.S. at 211.

issues.[93] To be sure, the Court has used the doctrine only a half a dozen times in more than two centuries. Traditional questions into which courts "ought not enter the political thicket"[94] include political apportionment and gerrymandering,[95] impeachment,[96] constitutional amendments,[97] and treaty abrogation.[98]

Now to this list add climate change. Somewhat surprisingly, federal courts have recently extended the doctrine in dismissing federal common law causes of action by states and citizens to address the effects of climate change. They have done so under both the textual and prudential prongs of the doctrine. As discussed in Parts III and IV, this is a wrong turn for the doctrine.

III. WHY CLIMATE CASES ARE NOT CONSTITUTIONALLY COMMITTED

The first prong of modern political question doctrine inquires as to whether the issue involves a "textually demonstrable constitutional commitment of the issue to a coordinate political department."[99] It is the "clearest statement of the six,"[100] and registers the "dominant consideration in any political question inquiry."[101] This Part explains why climate cases are not textually committed to a coordinate branch of government. It begins with explaining the types of issues that are subject to this prong of the doctrine, before moving on to how some courts have misapplied it in climate cases.

A. General Application

The Court has held matters "constutitionally committed" when they are expressly addressed by the Constitution. This includes federal congressional districting, foreign relations, impeachment of federal officers and constitutional amendments. Congressional districting provides perhaps the most salient use of this prong of the doctrine. For example, in *Colegrove v. Green*,[102] the plaintiffs argued that Illinois' congressional districting scheme violated the Republican Guarantee Clause because it did not apportion voting districts equally, which had the effect of accentuating the influence of rural voting districts and diluting that of urban districts inhabited predominantly by racial minorities. The Court elected to remain "aloof," finding apportionment constitutionally committed to

93. *Id.* at 217.
94. Colegrove v. Green, 328 U.S. 549 (1946).
95. *Id.*; *Baker*, 369 U.S. at 186.
96. Nixon v. United States, 506 U.S. 224 (1993).
97. Coleman v. Miller, 307 U.S. 433 (1939).
98. Goldwater v. Carter, 444 U.S. 996 (1979).
99. *Baker*, 369 U.S. at 217.
100. Barasich v. Columbia Gulf Transmission Co., 467 F. Supp. 2d 676, 681 (E.D. La. 2006).
101. *Id.* (quoting Saldano v. O'Connell, 322 F.3d 365, 369 (5th Cir. 2003) (citing *Nixon*, 506 U.S. at 252-53 (Souter, J., concurring))).
102. 328 U.S. 549, 550 (1946).

the House of Representatives:[103] "[T]he Constitution has conferred upon Congress exclusive authority to secure fair representation by the States in the popular House [of Representatives]."[104] Thus, the Court reasoned that "[c]ourts ought not to enter this political thicket."[105]

Foreign relations, constitutionally committed to the elected branches, are also subject to the political question doctrine. For example, the Court has also found that presidential abrogation of existing treaties falls under the political question doctrine. In *Goldwater v. Carter*, the Court in a plurality opinion ruled that the issue of whether the President could terminate a treaty unilaterally without Senate involvement is non-justiciable because "it involves the authority of the President in the conduct of our country's foreign relations."[106] The Court reasoned it should refrain when the dispute is "between coequal branches of our Government, each of which has resources available to protect and assert its interests, resources not available to private litigants outside the judicial forum."[107]

The Court has also concluded that the impeachment process is constitutionally committed to the elected branches. In *Nixon v. United States*,[108] a federal judge challenged his impeachment conviction by the Senate, claiming that the Constitution afforded him a trial before the full Senate instead of a committee of the Senate. Former federal judge Walter Nixon argued that while the Constitution provides an elaborate process for impeachment and conviction of federal officers for "Treason, Bribery, or other high Crimes and Misdemeanors,"[109] it is the Senate—and not a committee of the Senate—that has the "sole Power to try all Impeachments."[110]

The Court declined to engage the issues under the political question doctrine. It held that impeachment matters are constitutionally committed to the elected branches: "judicial review would be inconsistent with the Framers' insistence that our system be one of checks and balances."[111] It also found it would be imprudent to impose judicial standards on the impeachment process: "In addition to the textual commitment argument, we are persuaded that the lack of finality and the difficulty of fashioning relief counsel against justiciability."[112]

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103. *Id.* at 552-53 ("[T]he petitioners ask of this Court what is beyond its competence to grant. . . . [T]his controversy concerns matters that bring courts into immediate and active relations with party contests. From the determination of such issues this Court has traditionally held aloof.").
104. *Id.* at 554.
105. *Id.* at 556.
106. 444 U.S. 996, 1002 (1979) (Rehnquist, J., concurring).
107. *Id.* at 1004.
108. 506 U.S. 224, 226 (1993).
109. U.S. CONST. art. II, § 4.
110. *Id.* art. I, § 3, cl. 6.
111. *Nixon*, 506 U.S. at 234-35.
112. *Id.* at 236.

Finally, the Court has held that questions surrounding the constitutional amendment process are constitutionally committed. In *Coleman v. Miller*,[113] it ruled that challenges to the duration for holding open proposed amendments to the Constitution raise a non-justicable political question because the Constitution commits the amendment process to Congress.[114] It reasoned that judicial involvement in the matter would upend "[t]he respect due to coequal and independent departments."[115]

B. Application in Climate Cases

The leading case finding there to be a "textually demonstrable constitutional commitment" of climate change issues to a coordinate political department is *California v. General Motors Corp.*[116] In that case, the State of California brought a federal and state common law causes of action against General Motors, Toyota, Ford, Honda, DaimlerChrysler, and Nissan, seeking damages for "past and ongoing contributions to global warming, a public nuisance."[117] California claimed that the defendants produce more than 20 percent of CO_2 emissions in the United States, and 30 percent of all CO_2 emissions in California.[118] It complained that it has incurred substantial cost as a result of climate changes due to decreased snowfall and increased erosion, flooding and wildfires.[119] It asked that the court assess damages to defray the costs associated with these effects.

The court found the first prong of the *Baker v. Carr* test precluded judicial review. It enlisted Congress' enumerated power over interstate commerce, and the President and the Senate's complementary roles over foreign policy as evidence of a constitutional commitment of climate issues to the elected branches.[120] It observed that the Constitution gives Congress authority "[t]o regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes."[121] Thus, it concluded, "concerns raised by the potential ramifications of a judicial decision on global warming in this case would sufficiently encroach upon

113. 307 U.S. 433 (1939).

114. *Id.* at 452-55; *see also* U.S. CONST. art. V.

115. Baker v. Carr, 369 U.S. 186, 214 (1962). For opposing points of view as to how the political question doctrine applies to the constitutional amendment process, compare Laurence H. Tribe, *A Constitution We Are Amending: In Defense of a Restrained Judicial Role*, 97 HARV. L. REV. 433, 433-36 (1983), with Walter Dellinger, *The Legitimacy of Constitutional Change: Rethinking the Amendment Process*, 97 HARV. L. REV. 386, 387 (1983).

116. No. C06-05755 MJJ, 2007 WL 2726871 (N.D. Cal. Sept. 17, 2007); *see also* U.S. CONST. art. I, § 8, cl. 3.

117. Second Amended Compl. at ¶ 2, California v. Gen. Motors Corp., No. C06-05755 MJJ, 2007 WL 2726871 (N.D. Cal. Sept. 17, 2007).

118. *Id.* ¶ 40.

119. *Id.* ¶ 1.

120. *Id.*; *see also* U.S. CONST. art. II, § 2, cl. 2.

121. *Gen. Motors Corp.*, 2007 WL 2726871, at *13; *see also* U.S. CONST. art. I, § 8, cl. 3.

interstate commerce, to cause the Court to pause before delving into such areas so constitutionally committed to Congress." [122]

Pause it did. The court concluded that the plaintiffs' claims involved areas textually committed to Congress under the Commerce Clause. It reasoned that a state's control over interstate markets for automobiles is "subordinate to the federal power over interstate commerce."[123]

It also expressed a concern tantamount that under the dormant Commerce Clause, insofar as states are "constrained by the need to respect the interests of other States."[124] The court was uncomfortable with the notion of fashioning a remedy that could implicate commerce in other states:

> [R]ecognizing such a new and unprecedented federal common law nuisance claim for damages would likely have commerce implications in other States by potentially exposing automakers, utility companies, and other industries to damages flowing from a new judicially-created tort for doing nothing more than lawfully engaging in their respective spheres of commerce within those States.[125]

Next, it held climate issues constitutionally committed to the "foreign policy" roles of the coordinate branches because they have "weighed in" on the issue of climate change.[126] The court maintained that inaction by the coordinate branches is sufficient to constitute "foreign policy determinations regarding the United States' role in the international concern about global warming."[127] It concluded that congressional inaction signaled a deliberate decision "to refrain from any unilateral commitment to reducing [GHG] emissions domestically unless developing nations make a reciprocal commitment," and that the President has reached the same result because, according to EPA, unilateral domestic action "would impede that diplomatic objective."[128] Thus, the court concluded, plaintiffs' federal question common law raised a nonjusticiable political question.[129]

Another court facing similar issues declined to find any constitutional commitment of climate issues to the coordinate branches. It nonetheless used the second prong of the political question doctrine to dismiss the lawsuit, as discussed below in Part IV. In *Connecticut v. American*

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122. *Gen. Motors Corp.*, 2007 WL 2726871, at *14.
123. *Id.* at *13.
124. *Id.* (citing Healy v. Beer Institute, 491 U.S. 324 (1989); Gibbons v. Ogden, 22 U.S. 1, 194-96 (1824)).
125. *Id.* at *14.
126. *Id.*
127. *Id.*
128. *Id.*
129. *Id.*

Electric Power Co., Inc.,[130] a collection of states and private conservation organizations sued the nation's five largest emitters of carbon dioxide under federal common law and state public nuisance law to redress the effects of climate change.[131] The states claimed to have brought the suit for injunctive relief to address, *inter alia*, "irreparable harm" to the health, safety and well-being of their 77 million citizens.[132] Plaintiffs claimed that the power companies' annual emissions of 650 million tons of carbon dioxide—which constitute roughly "one-quarter of the U.S. [] power sector's [CO_2] emissions" and 10 percent of global emissions by humans—contribute to global climate change by trapping atmospheric heat.[133] Accordingly, plaintiffs asked the court to "enjoin[] each of the Defendants to abate its contribution to the nuisance by capping its emissions of carbon dioxide and then reducing those emissions by a specified percentage each year for at least a decade."[134] It also asked that the court "assess and measure available alternative energy resources," and reconcile its relief with U.S. foreign and domestic policy.[135]

As criticized in Part IV below, while the court held that the political question doctrine rendered the case non-justiciable, it did not do so because it found any constitutional commitment of the issue to the elected branches. Instead, it applied the prudential prong of the doctrine, finding it impossible to decide the case without an initial policy determination from the elected branches. Even though the elected branches lack a cogent climate policy, the court reasoned that "deliberate inactions"[136] is informed by issues of national security, the environment, and foreign policy, which counsel non-interference by the judicial branch.[137]

C. *Criticism of Application of* Baker*'s Textual Formulation in Climate Cases*

The court's application of the first prong of the political question doctrine to foreclose review in *California v. General Motors Corp.* is incorrect for two reasons.

First, there is no "textual commitment" of climate issues to the elected branches. Simply, for this prong to apply, the commitment must be "textual," not inferential. The Constitution must textually address the matter at hand. It does not. Thus, this prong does not apply. While cli-

130. 406 F. Supp. 2d 265 (S.D.N.Y. 2005). The defendants are the American Electric Power Company, the Southern Company, the Tennessee Valley Authority, Xcel Energy and Cinergy Corporation.

131. *Id.* at 267. The plaintiffs included California, Connecticut, Iowa, New York, New Jersey, Rhode Island, Vermont, and Wisconsin, and the City of New York. *Id.*

132. *Id.* at 268.

133. *Id.*

134. *Id.* at 270.

135. *Id.* at 272.

136. *Id.* at 273.

137. *Id.* at 274.

mate cases have political dimensions, it bears repeating Justice Brennan's instruction from *Baker v. Carr* that "political cases" are not "political questions" cordoned off from judicial review.

Second, the precedent that informs use of this prong is inapposite to climate cases. Unlike the Constitution's specific consignment of congressional districting to Congress under the Guaranty Clause in *Colegrove*, the process for Presidential negotiation and Senate ratification of treaties under the Treaty Clause in *Goldwater v. Carter*, the process for Senate conviction of impeachable offenses under the Impeachment Clauses in *U.S. v. Nixon*, and the process for amending the U.S. Constitution under Article V in *Coleman v. Miller*, the Constitution does not assign climate issues to either political branch.

To be sure, a federal court applied this reasoning in concluding there is a lack of a textual constitutional commitment to the coordinate branches for addressing a related, complex environmental concern with political dimensions. In *Barasich v. Columbia Gulf Transmission Co.*,[138] the plaintiffs alleged that defendants' network of nearly 10,000 miles of petroleum pipelines in south Louisiana so altered the hydrology and physiology of more than one million acres of marshlands that it deprived inland communities "of their natural protection from hurricane winds and accompanying storm surge," thereby exacerbating the adverse affects of Hurricane Katrina and resulting in personal injury, death, and property damage.[139] Defendants argued that the political question doctrine deprived the court of jurisdiction to hear the claims.[140]

The court rejected the idea that there might be a commitment of the claims to the elected branches in the text of the Constitution: "Here, the defendants do not contend, and the Court does not find, that there is a textually demonstrable commitment of coastal erosion questions to a coordinate political department."[141]

IV. WHY CLIMATE CASES ARE NOT PRUDENTIALLY COMMITTED

The second prong of the *Baker v. Carr* formulation inquires as to whether, in the absence of a constitutional commitment of an issue to an elected branch, federal courts ought to exercise restraint as a matter of political comity and prudence. In particular, the second prong holds that a matter is not justiciable if it engenders (1) a "lack of judicially discoverable and manageable standards," (2) an "impossibility of deciding the case without an initial policy determination of the kind clearly for nonjudicial discretion," (3) an impossibility of a court's undertaking independ-

138. 467 F. Supp. 2d 676 (2006).
139. *Id.* at 679-80.
140. *Id.* at 680.
141. *Id.* at 682.

ent resolution without expressing lack of the respect due coordinate branches of the government," (4) an "unusual need for unquestioning adherence" to a political decision made by the elected branches, or (5) "the potentiality of embarrassment from multifarious pronouncements" by the coordinate branches.[142] Judicial treatment in the climate context has focused on the first two of these, that is, the existence of standards and the need for antecedent policy determination by the elected branches.

A. Existence of Judicially Discoverable/Manageable Standards

1. Standard

The lack of constitutionally judicially discoverable and manageable standards has served to thwart judicial involvement in other contexts in which neither the Constitution nor the courts have developed standards, including political gerrymandering, naturalization and military policies.

For example, the Court has held that claims of malapportionment of state legislative districts are justiciable due to the existence of judicially-established standards construing the Equal Protection Clause. In the fountainhead case of *Baker v. Carr*, voters in Tennessee complained that the malapportionment of the Tennessee General Assembly violated the Equal Protection Clause "by virtue of the debasement of their votes."[143] Even though the Tennessee Constitution allocated representation in the General Assembly on the basis of population, the assembly had not reapportioned its districts since 1901, despite a dramatic population shift from rural to urban centers amply populated by racial and ethnic minorities. The plaintiffs asked the Court to enjoin further elections until districts could be reapportioned "by mathematical application of the Tennessee constitutional formulae" to match U.S. Census figures.[144] Following *Colegrove*, the lower court declined to enter the political thicket.[145]

In reversing, the Supreme Court distinguished *Colegrove*, noting that the Republican Guarantee Clause applies to apportionment of federal—not state—legislative districts: "this challenge to an apportionment presents no nonjusticiable 'political question.'"[146] That the matter involves a political process is immaterial: "[T]he mere fact that the suit seeks protection of a political right does not mean it presents a political question. Such an objection 'is little more than a play upon words.'"[147] In considering the "contours" of the doctrine, the court observed that "it is the relationship between the judiciary and the coordinate branches of

142. *Id.* at 680.
143. Baker v. Carr, 369 U.S. 186, 188 (1962).
144. *Id.* at 195.
145. *Id.* at 196-97.
146. *Id.* at 209.
147. *Id.*

the Federal Government, and not the federal judiciary's relationship to the States, which gives rise to the 'political question.'"[148]

The Court has held that challenges to disproportionate apportioning of federal congressional districts under the Guaranty Clause are judicially unmanageable.[149] In *Luther v. Borden*,[150] two competing groups laid claim to being the rightful government of the State of Rhode Island following a disputed statewide election. In finding the challenge to the election results non-justiciable, the Court held that the "Guaranty Clause is not a repository of judicially manageable standards . . . to identify a State's lawful government."[151] In *Vieth v. Jubelirer*,[152] a plurality of the Court rejected a claim of political gerrymandering due to the lack of any "judicially discernible and manageable standards" to determine what would constitute constitutionally equitable voting districts.

Furthermore, lower courts have also relied on the lack of "any" judicial standards in dismissing cases under the political question doctrine. Some circuit courts have concluded that state challenges under the Naturalization Clause[153] to federal immigration programs are non-justiciable due to the lack of standards for assessing the constitutionality of immigration policies.[154] Others have held that the lack of judicially discoverable standards renders challenges to military policies unreviewable, including those involving military aid[155] and action,[156] and deployment of weapons.[157]

2. Application in Climate Cases

The court in *California v. General Motors Corp.* incorrectly invoked the first component of the prudential prong of the political question to dismisss plaintiffs' federal public nuisance claims, holding that there is a lack of applicable judicially discoverable or manageable standards. Plaintiffs argued that a long lineage of federal common law causes of action in environmental pollution cases well supplied judicially discoverable standards.[158] The plaintiffs portrayed the case as one of

148. *Id.* at 210.

149. The Guaranty Clause reads: "The United States shall guarantee to every State in this Union a Republican Form of Government." U.S. CONST. art. IV, § 4.

150. 48 U.S. 1 (1849).

151. *Baker*, 369 U.S. at 223.

152. 541 U.S. 267, 281 (2005).

153. The Clause gives Congress the authority "to establish [a] uniform rule of Naturalization." U.S. CONST. art. I, § 8, cl. 4.

154. *See, e.g.*, Texas v. United States, 106 F.3d 661 (5th Cir. 1997).

155. *See, e.g.*, Crockett v. Reagan, 720 F.2d 1355 (D.C. Cir. 1983).

156. *See, e.g.*, DaCosta v. Laird, 471 F.2d 1146 (2d Cir. 1973).

157. *See, e.g.*, Greenham Women Against Cruise Missiles v. Reagan, 591 F. Supp. 1332 (S.D.N.Y. 1984).

158. California v. Gen. Motors Corp., No. C06-05755, 2007 WL 2726871, at *2 (N.D. Cal. Sep. 17, 2007).

"simple nuisance" well suited for traditional principles of tort law.[159] Thus, plaintiffs contended that courts, rather than legislative bodies, are better equipped to decide whether defendants' actions constitute an "unreasonable interference with a right common to the general public."[160] Moreover, plaintiffs argued that the court is better equipped to reach the merits and mete relief than the elected branches.[161]

The court was unconvinced. It found inapposite a line of cases dating back 170 years based on differences in remedy, legal framework and circumstances. First, the court found the cases inherently distinguishable because the remedy requested in each was for "equitable remedies to enjoin or abate the nuisance," and not legal relief.[162] Second, it found a "legal framework" lacking, insofar as the court "is left without guidance in determining what is an unreasonable contribution to the sum of carbon dioxide . . . or in determining who should bear the costs . . . ."[163] Third, it found the prior cases inapplicable "because none of the pollution-as-public-nuisance cases implicates a comparable number of national and international policy issues."[164] Fourth, it found the "multiple worldwide sources of atmospheric warming across myriad industries and multiple countries" made the prior cases distinguishable.[165] Instead, it determined that the prior cases "involve primarily issues of local concern involving a state or public entity seeking equitable relief from a source-certain nuisance in a neighboring state."[166] Thus the court concluded that it "is left without a manageable method of discerning the entities that are creating and contributing to the alleged nuisance."[167] Last, it seemed resigned that the issue of allocating responsibility is simply beyond judicial competence "given the myriad sources of global [GHGs] and the '[s]ubstantial scientific uncertainties [that] limit [the] ability to . . . separate out those changes resulting from natural variability from those that are directly the result of increases'" in human emissions of GHGs.[168]

Central to the court's application of the political question doctrine in *Connecticut v. American Electric Power Co.* is that plaintiffs sought an *abatement* order to have the court determine how, when and by whom CO_2 emissions would be reduced. The court felt these tough choices involving whose ox to gore is best left to the political branches. Left

159. *Id.*
160. *Id.* at *8 (quoting *In re* Oswego Barge Corp., 664 F.2d 327, 332 n.5 (2d Cir. 1981)).
161. *Id.*
162. *Id.* at *15.
163. *Id.*
164. *Id.*
165. *Id.*
166. *Id.*
167. *Id.*
168. *Id.* at *14 (alteration in original) (quoting Control of Emissions from New Highway Vehicles and Engines, 68 Fed. Reg. 52922-02 (Sept. 8, 2003)).

open was the extent to which federal courts may calculate monetary damages attributable to CO_2 emissions in a public nuisance action.

Would the result have been any different had the states in *Connecticut v. American Electric Power Co.* sought monetary damages instead of injuctive relief, thereby not raising the same social choice issues that so concerned the court?

The court in *California v. General Motors Corp.*[169] answered no. In *General Motors*, the State of California asked the court "to create a quotient or standard in order to quantify any potential damages that flow from Defendants' alleged act of contributing thirty percent of California's carbon dioxide emissions."[170] The court dismissed the action, concluding that the political question doctrine precludes the judicial branch from determining the representative portion of monetary damages for which defendants are liable for causing and contributing to global climate change.

The court determined it could not reach a ruling that is "principled, rational, and based upon reasoned distinctions."[171] Thus it held judicial review would be "inconsistent with the Framers' insistence that our system be one of checks and balances,"[172] and because each factor is "inextricable" from plaintiffs' claims, they presented non-justiciable political questions.[173]

3. Criticism of Application of *Baker*'s "Judicial Standards" Formulation to Climate Cases

General Motors' application of the "judicial standards" aspect of the prudential component of the political question doctrine is incorrect for two reasons. First, it seems to ignore that two centuries of common law amply supply judicial standards for deciding whether there is an "unreasonable [use or] interference with a right common to the general public."[174] As the court noted in *Barasich v. Columbia Gulf Transmission Co.*,[175] that the courts—and not the Constitution or Congress—supply the standard is immaterial.

Second, whether judicially discoverable and manageable standards already exist is not dispositive of whether such standards are available. For example, in *Vieth*, in which a plurality held that courts cannot fash-

169. *Id.* at *1.
170. *Id.* at *8.
171. *Id.* at *15 (quoting Vieth v. Jubelirer, 541 U.S. 267, 278 (2004)).
172. *Id.* at *16 (internal quotation marks omitted) (quoting Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 267 (S.D.N.Y. 2005) (internal quotation marks omitted)).
173. *Id.*
174. *Id.* at *8 (internal quotation marks omitted) (quoting United States v. Oswego Barge Corp., 654 F.2d 327, 333 n.5 (2d Cir. 1981)).
175. 467 F. Supp. 2d 676 (2006).

ion standards for deciding whether voting districts are unconstitutionally apportioned, four Justices believed such standards already exist,[176] while a fifth refused to agree that all future political gerrymandering cases are nonjusticiable.[177] Thus, even if no court has yet "fashioned" standards for deciding how to apportion responsibility for climate, this does not mean that it cannot and should not be done.

B. Need for Initial Policy Determination

1. Standard

Outside the climate context, the case law is devoid of meaningful juridical application of this formulation from *Baker v. Carr.*

2. Application in Climate Cases

Some federal courts have declined to hear climate cases, incorrectly citing the need for an initial policy determination by the elected branches. For example, in *Connecticut v. American Electric Power Co.*, the defendants contended that having the court "resolve an environmental policy question with sweeping implications for the nation's economy, its foreign relations, and even potentially its national security, . . . put[s] the cart before the horse."[178] It maintained that federal courts should exercise judicial restraint in "resolving questions of high policy, which are for the political branches."[179]

The court agreed, holding that that plaintiffs' climate claims raised "non-justiciable" political questions because they require the court to make "initial policy determinations" best left to the other political branches of government.[180] The court found itself paralyzed to address climate claims due to the "the impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion."[181]

It distinguished the "typical" air pollution case under federal common law. These include *Georgia v. Tennessee Copper Co.*,[182] which involved balancing between environmental protection and economic development, factors that drive decisions about the type and timeframe of pollution control equipment.[183] At bottom, the court concluded that

176. *See Vieth*, 541 U.S. at 317 (Stevens, J., dissenting).
177. *Id.* (Kennedy, J., concurring).
178. *Am. Elec. Power Co.*, 406 F. Supp. 2d at 271.
179. *Id.*
180. *Id.* at 272.
181. *Id.* (quoting *Vieth*, 541 U.S. at 278).
182. 206 U.S. 230, 239 (1907).
183. *See id.* at 239; *Am. Elec. Power Co.*, 406 F. Supp. 2d at 272.

the case was sufficiently dissimilar from most air pollution cases as to render it non-justiciable.[184]

The court in *American Electric Power Co.* wanted no part of this hot potato. It found plaintiffs' allegations "extraordinary," and "patently political."[185] It noted that the "scope and magnitude of the relief Plaintiffs seek reveals the transcendently legislative nature of this litigation."[186] It believed the claims would require the court to balance environmental, economic, and "other" foreign policy and national security interests, without direction from the elected coordinate branches of government.[187] The court also agreed with defendants that CO_2 reduction required coordinated domestic and international action.[188]

Thus, the court concluded that it was impossible for it to hear the claims without an "initial policy determination" by the elected branches "before a non-elected court can properly adjudicate a global warming nuisance claim."[189]

Curiously, under "elected branches," the court included the EPA, which it noted "has been grappling with the proper approach to the issue of global climate change for years."[190] As "grappling" proof that the court should refrain from making an "initial policy determination," it endorsed the following from EPA:[191]

> It is hard to imagine any issue in the environmental area having greater "economic and political significance" than regulation of activities that might lead to global climate change. The issue of global climate change . . . has been discussed extensively during the last three Presidential campaigns; it is the subject of debate and negotiation in several international bodies; and numerous bills have been introduced in Congress over the last 15 years to address the issue. Unilateral [regulation of carbon dioxide emissions in the United States] could also weaken U.S. efforts to persuade key developing countries to reduce the [greenhouse gas] intensity of their economies. Unavoidably, climate change raises important foreign policy issues, and it is the President's prerogative to address them. Virtually every sector of the U.S. economy is either directly or indirectly a source of [greenhouse gas] emissions, and the countries of the world are involved in scientific, technical, and political-level discussions about climate change.

184. *See Am. Elec. Power Co.*, 406 F. Supp. 2d at 272.
185. *Id.* at 271 n.6.
186. *Id.* at 272.
187. *Id.* at 274.
188. *Id.* at 273.
189. *Id.*
190. *Id.*
191. *Id.* (citations omitted).

The court also interpreted congressional silence as tacit acceptance that the courts ought not get involved:

> The explicit statements of Congress and the Executive on the issue of global climate change in general and their specific refusal to impose the limits on carbon dioxide emissions Plaintiffs now seek to impose by judicial fiat confirm that making the "initial policy determinations" addressing global climate change is an undertaking for the political branches.[192]

Thus, the court concluded that the mélange of environmental, economic, foreign policy and national security implications of the case "present non-justiciable political questions that are consigned to the political branches, not the Judiciary."[193]

The court in *General Motors* reached the same result for different reasons. It believed that the CAA's scheme for regulating emissions, when fused with other federal schemes concerning fuel efficiency, suggests climate cases require an initial policy determination from the elected branches.

The court started with emissions. Title II of the Clean Air Amendments Act of 1970 (CAA) required that new "light duty vehicles" (essentially passenger cars[194]) reduce hydrocarbon and carbon monoxide emissions, and then nitrogen oxides, by 90 percent within five and six years, respectively.[195] After initially objecting strenuously to the imposition of emission standards, automobile manufacturers were achieving them by the 1980s, largely due to the installation of advanced catalytic converters.[196]

The EPA has a preeminent role in establishing tailpipe emission standards. The EPA may establish tailpipe emission standards for additional pollutants than those mentioned above for "any air pollutant . . . which in [its] judgment cause[s], or contribute[s] to air pollution which may reasonably be anticipated to endanger public health or welfare."[197]

Title II does not leave the business of emission standards solely with EPA. Unlike most environmental laws, the CAA not only allows states to implement standards and ensure their achievement, but provides

192. *Id.* at 274.
193. *Id.*
194. *See* Natural Res. Def. Council v. EPA, 655 F.2d 318, 322 n.3 (D.C. Cir. 1981).
195. Clean Air Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676, 1690, 1692 (1970).
196. For a helpful discussion of this period, see Holly Doremus, *Constitutive Law and Environmental Policy*, 22 STAN. ENVTL. L.J. 295, 345-46 (2003); *see also* Whitman v. Am. Trucking Ass'ns, 531 U.S. 457, 492 (2001) (Breyer, J., concurring) (noting role of catalytic converter technology in helping to achieve national air quality standards).
197. 84 Stat. 1676.

them the capacity to establish standards as well, in a kind of microcosmic reflection of dual federalism.[198]

Following a statutory scheme that evolved from the advent of the original Clean Air Act,[199] the CAA both precludes and invites state tailpipe emission standards. Section 209(a) explicitly preempts states from adopting "any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines."[200] Yet section 209(b) allows California to achieve a "waiver" from federal standards provided it finds that its own standards "will be, in the aggregate, at least as protective of public health and welfare as applicable Federal standards," and that EPA determines that they are (1) not "arbitrary and capricious" considering feasibility and costs, (2) not inconsistent with federal tailpipe emission standards under section 202, and (3) that California needs its own more stringent standards to meet a local "compelling . . . condition[]."[201]

Other states may adopt their own tailpipe emission standards, so long as they are identical to California's standards. Section 177 allows other states to adopt and enforce standards "identical to" any for which EPA has granted a waiver to California, as long as the standards are adopted at least two years prior to the applicable model year.[202] This overlapping regulatory scheme is a compromise "between the states, which wanted to preserve their traditional role in regulating motor vehicles, and the manufacturers, which wanted to avoid the economic disruption latent in having to meet fifty-one separate sets of emissions control requirements."[203]

In 1999 a group of watchdog and public interest groups petitioned EPA to engage in rulemaking to set emission standards for GHGs under Title II of the CAA.[204] EPA denied the petition in 2003, maintaining that

198. This happened incrementally. Congress's initial foray into regulating vehicle emissions, Motor Vehicle Air Pollution Control Act, Pub. L. No. 89-272, 79 Stat. 992 (1965), explicitly recognized the need for, but did little to unseat state primacy concerning motor vehicle licensing and operation, and did not preempt state efforts respecting emissions. *See* Motor Vehicle Mfrs. Ass'n of the United States, Inc. v. N.Y. State Dep't of Envtl. Conservation (*MVMA III*), 17 F.3d 521, 524-25 (2d Cir. 1994); Motor & Equip. Mfrs. Ass'n, Inc. v. E.P.A. (*MEMA I*), 627 F.2d 1095, 1101 (D.C. Cir. 1979).

199. The Air Quality Act of 1967 set forth the framework for establishing national standards. Air Quality Act of 1967, Pub. L. No. 90-148, 81 Stat. 485 (1967). Yet it also preserved state authority, such as California had already exercised, to establish more stringent standards, provided it could show a compelling need and that its standards were consistent with the Act. *Id.* at 501.

200. 42 U.S.C.A. § 7543(a) (West 2008).

201. § 7543(b).

202. 42 U.S.C.A. § 7507 (West 2008). Fourteen states have adopted California's emission limitations. *See generally* CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, AIR RESOURCES BOARD, FREQUENTLY ASKED QUESTIONS: CLIMATE CHANGE EMISSION REDUCTION STANDARDS FOR VEHICLES (2007), *available at* http://www.arb.ca.gov/cc/factsheets/ccfaq.pdf.

203. *MEMA I*, 627 F.2d at 1109.

204. Petition for Rulemaking and Collateral Relief Seeking the Regulation of Greenhouse Gas Emission from New Motor Vehicles under Section 202 of the Clean Air Act, Control of Emissions

the Clean Air Act does not authorize it to regulate emissions to address global climate change and that it has discretion not to regulate based on policy considerations, including foreign policy.[205]

This prompted the State of Massachusetts and a litany of mostly downwind "blue" states and environmental organizations to challenge EPA's inaction, contending that it improperly exercised its discretion in denying petition by several states calling for rulemaking to regulate carbon dioxide and three other greenhouse gas emissions—methane, nitrous oxide, and hydrofluorocarbons—from new motor vehicles under Title II of the Clean Air Act.[206]

In *Massachusetts v. EPA*,[207] the Court disagreed with EPA's bases for denying the rulemaking petition. The Court decided three issues. First, that petitioners (namely, Massachusetts) demonstrated standing under Article III of the U.S. Constitution to challenge EPA's inaction.[208] The Court held that states enjoy "special solicitude" in demonstrating standing.[209] Second, the Court held that greenhouse gas emissions constitute an "air pollutant" under the Clean Air Act's "capacious definition of 'air pollutant.'"[210] Last, it held that EPA "offered no reasoned explanation" and that it was arbitrary and capricious for the agency to refuse to decide if these emissions "endanger public health or welfare" due to policy considerations not listed in the Clean Air Act, mainly foreign policy.[211] Justice Scalia thought the Court should have deferred to EPA in what he said was a "straightforward administrative law case," and that it had "no business substituting its own desired outcome for the reasoned judgment of the [EPA]."[212]

The court in *General Motors* then turned to efficiency. Efficiency standards for automobiles, known as "corporate average fuel economy" or "CAFE" standards,[213] are set under the auspices of the Energy Policy

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From New Highway Vehicles and Engines, 68 Fed. Reg. 52,922, 52,922-23 (Sept. 8, 2003), *available at* http://www.icta.org/doc/ghgpet2.pdf.

> The International Center for Technology Assessment (CTA) is a non-profit, bi-partisan organization committed to providing the public with full assessments and analyses of technological impacts on society. CTA is devoted to fully exploring the economic, ethical, social, environmental and political impacts that can result from the applications of technology or technological systems.

International Center for Technology Assessment, About Us, http://www.icta.org/about/index.cfm (last visited Mar. 26, 2008).

205. 68 Fed. Reg. 52,922, 59,933.

206. Massachusetts v. EPA, 127 S. Ct. 1438, 1446 (2007).

207. *Id.* at 1438. For a captivating account of her role in this case, see Lisa Heinzerling, *Climate Change in the Supreme Court*, 38 ENVTL. L. REV. (forthcoming 2008).

208. *Massachusetts*, 127 S. Ct. at 1453.

209. *Id.* at 1454-55.

210. *Id.* at 1462 (majority opinion).

211. *Id.* at 1462-63.

212. *Id.* at 1478 (Scalia, J., dissenting).

213. Gen. Motors Corp. v. Nat'l Highway Traffic Safety Admin., 898 F.2d 165, 167 (D.C. Cir. 1990). *See generally* Amendment to Motor Vehicle Information and Cost Savings Act, Pub. L. No. 94-163, § 301, §§ 501-12, 89 Stat. 901, 901-16 (1975).

and Conservation Act (EPCA), which Congress enacted in response to the energy crisis of the 1970s.[214] EPCA's aim is to "provide for improved energy efficiency of motor vehicles."[215] When Congress enacted EPCA in 1975, CAFE standards stood at roughly 14 miles per gallon of gasoline (mpg). The EPCA required CAFE standards achieve 18 mpg by 1978, and further improve to 27.5 mpg by 1985, roughly doubling fuel efficiency fleet-wide.[216] EPCA authorizes the Secretary of Transportation, and its designee the National Highway Traffic Safety Administration (NHTSA),[217] to adopt different standards thereafter.[218] Section 32902(f) provides that when "deciding maximum feasible average fuel economy under this section, [NHTSA] shall consider technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy."[219]

The average fuel economy standard for passenger automobiles remains at 27.5 mpg, the standard enacted in 1975 and in place since model year 1985.[220] It was not until 2006 that NHTSA set CAFE standards for light trucks, which run from 2008 to 2010.[221] Basically, the emission standards for light trucks are 22.5, 23.1 and 23.5 for model years 2008, 2009 and 2010, respectively.[222] The NHTSA's standards for light duty trucks are due to expire with the 2010 model year. Unlike the CAA and emissions, EPCA specifically preempts state fuel efficiency standards.[223]

The court in *General Motors* held that the Clean Air Act's "comprehensive state and federal scheme to control air pollution in the United States," coupled with the Energy Policy and Conservation Act's "comprehensive response to the energy crisis of the 1970's," when "read in conjunction with the prevalence of the international and national debate, and the resulting policy actions and inactions . . . would require an initial

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214. Energy Policy and Conservation Act, Pub. L. No. 94-163, 89 Stat. 871 (1975); *see also Gen. Motors*, 898 F.2d at 167 (discussing EPCA's legislative history).

215. § 2(5), 89 Stat. 871.

216. § 301, § 502(a)(1), 89 Stat. 901; *Gen. Motors*, 898 F.2d at 167.

217. Delegation to the National Highway Traffic Safety Administrator, 49 C.F.R. § 1.50 (2008).

218. *See* S. REP. NO. 94-516, at 119, 153-54 (1975) (Conf. Rep.), *reprinted in* 1975 U.S.C.C.A.N. 1956, 1959-60, 1994-95.

219. 49 U.S.C.A. § 32902(f) (West 2008).

220. § 32902(b)(4)(A).

221. Average Fuel Economy Standards for Light Trucks Model Years 2008-2011, 71 Fed. Reg. 17566 (Apr. 6, 2006) (codified at 49 C.F.R. pts. 523, 533, and 537).

222. *Id.* at 17568. "Reformed" standards, which take into account a light truck's wheelbase and track width, are 22.7, 23.4 and 23.7 mpg for model years 2008, 2009 and 2010, respectively. *Id.* at 17624.

223. 49 U.S.C.A. § 32919(a) (West 2008). Section 32919(a) provides that

> When an average fuel economy standard prescribed under this chapter is in effect, a State or a political subdivision of a State may not adopt or enforce a law or regulation related to fuel economy standards or average fuel economy standards for automobiles covered by an average fuel economy standard under this chapter.

policy determination of the type reserved for the political branches of government."[224] Considering this "legislative landscape," the court mused that it should not "inject[] itself into the global warming thicket."[225]

The court also found support for its holding from the Supreme Court's standing analysis in *Massachusetts v. EPA*.[226] EPA argued that Massachusetts lacked standing, given the relatively dissipated effect of requiring EPA to act—reducing greenhouse gas emissions by less than five percent annually at best—and the tenuous connection between climate change and Massachusetts' costs due to shoreline loss and health care.[227]

On behalf of the Court, Justice Stevens upheld Massachusetts' standing, finding that states enjoy "special solicitude" in the standing analysis.[228] The majority emphasized the fact "[t]hat these climate-change risks are 'widely shared' does not minimize Massachusetts' interest in the outcome of this litigation,"[229] suggesting a more commodious interpretation of the "injury in fact" component of constitutional standing.

In addition, the majority accorded a similarly capacious treatment of the causation and redressability components of standing. It concluded that incremental increases in carbon dioxide emissions as a result of the EPA's failure to regulate fulfilled the causation element,[230] and with respect to redressability, "[a] reduction in domestic emissions would slow the pace of global emissions increases, no matter what happens elsewhere."[231]

The majority's "special solicitude" veneer for state standing drew a rebuke from Chief Justice Roberts, who questioned Stevens' "state solicitude" standard as an "implicit concession that petitioners cannot establish standing on traditional terms."[232]

The court in *General Motors* found support from all corners of the majority's opinion in *Massachusetts v. EPA* for its determination that the lack of initial policy precludes climate cases. First, it decided that the Supreme Court's reasoning that state plaintiffs are entitled to "special solicitude" in standing analysis supported its political question analysis: "[*Massachusetts v. EPA*] further underscores the conclusion that policy

224. California v. Gen. Motors Corp., No. 3:06-CV-05755 MJJ, 2007 WL 2726871, at *24, *27, *29 (N.D. Cal. Sept. 17, 2007).
225. *Gen. Motors Corp.*, 2007 WL 2726871, at *24, *29.
226. 127 S. Ct. 1438 (2007).
227. *Id.* at 1453, 1456-57.
228. *Id.* at 1455.
229. *Id.* at 1456.
230. *Id.* at 1457.
231. *Id.* at 1458.
232. *Id.* at 1466.

decisions concerning the authority and standards for carbon dioxide emissions lie with the political branches of government."[233] The court concluded that *Massachusetts v. EPA*'s "special solicitude" for state standing supports the idea that policymaking about climate ought to be left to the federally elected branches.[234]

Next, the court concluded that the Supreme Court's interpretation of the Clean Air Act in *Massachusetts v. EPA* shows states have "surrendered" federal common law claims to EPA and the federal government, including policy.[235]

Finally, it determined that *Massachusetts v. EPA* does "not sanction the justiciability of the interstate global warming damages tort claim now before this Court."[236] Instead, the court construed the Supreme Court's recognition of California's right to sue EPA for action to be a tacit rejection of the same state's ability to sue private parties for damages unrelated to EPA action.

3. Criticism of Application of *Baker*'s "Initial Policy Determination" Prong

The courts in *American Electric Power* and *General Motors* misapplied this prong in at least three respects. First, the most salient criticism of using this aspect of *Baker* to avoid the "global warming thicket" is that it is patently wrong to conclude that the elected branches have yet to make an *initial* policy determination.

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233. California v. Gen. Motors Corp., No. 3:06-CV-05755 MJJ, 2007 WL 2726871, at *30 (N.D. Cal. Sept. 17, 2007).

234. *Id.* at *33-34 (internal citations omitted). The court wrote:

> Underpinning the Supreme Court's standing analysis is the concept that the authority to regulate carbon dioxide lies with the federal government, and more specifically with the EPA as set forth in the CAA. Also inherent in the Supreme Court's reasoning is the principle that any State that is dissatisfied with the federal government's global warming policy determinations may exercise its "procedural right" to advance its interests through administrative channels and, if necessary, to "challenge the rejection of its rulemaking petition as arbitrary and capricious." Thus, such an approach emphasizes that initial policy determinations are made by the political branches while preserving a framework for judicial review of those determinations.

Id.

235. *Id.* at *35-36 (internal citations omitted). The court wrote:

> The underpinnings of the Supreme Court's rationale in *Massachusetts* only reinforce this Court's conclusion that Plaintiff's current tort claim would require this Court to make the precise initial carbon dioxide policy determinations that should be made by the political branches, and to the extent that such determination falls under the CAA, by the EPA. Because the States have "surrendered" to the federal government their right to engage in certain forms of regulations and therefore may have standing in certain circumstances to challenge those regulations, and because new automobile carbon dioxide emissions are such a regulation expressly left to the federal government, a resolution of this case would thrust this Court beyond the bounds of justiciability. Plaintiff has failed to offer an adequate explanation of how this Court would possibly endeavor to make the initial policy determinations that would be both necessary and antecedent to a resolution of this case.

Id.

236. *Id.* at *36.

To the contrary, there is direct evidence that the elected branches have adopted a policy to reduce GHGs. *Black's Law Dictionary* defines "policy" to include "[t]he general principles by which a government is guided in its management of public affairs."[237] As evidenced by averments from the White House,[238] the State Department,[239] and the EPA, [240] the United States has clearly adopted and currently adheres to a "general principle" to reduce emissions of GHGs.[241] Legislative acquiescence to this policy is evidenced by the Senate's ratification of the UNFCCC, and by the numerous enactments to study climate change.[242] Indeed, in his dissent in *Massachusetts v. EPA,* Chief Justice Roberts perhaps put it best: "[Global warming] is not a problem that has escaped the attention of policymakers in the Executive and Legislative branches of our Government, who continue to consider regulatory, legislative and treaty-based means of addressing global climate change."[243]

Second, allowing states and individuals to pursue federal common law causes of action is consistent with the policy of reducing GHG emissions. Injuctive and legal relief constitutes not an establishment of initial policy but instead an implementation of existing policy.[244]

Third, deciding whether the "political question doctrine" applies has little to do with whether the underlying policy issue is "complex," invites social inefficiency, or is "political" in nature. Most people would agree that issues of climate change are controversial, complex, and invite action by the elected political branches. They might recognize that there

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237. BLACK'S LAW DICTIONARY 1196 (8th ed. 2004). Furthermore, *Black's Law Dictionary* directs the reader to the term "public policy," which means "[b]roadly, principles and standards regarded by the legislature or by the courts as being fundamental concern to the state and the whole of society." *Id.* at 1267.

238. The White House, News & Policy, Policies in Focus, Energy, http://www.whitehouse.gov/infocus/energy/ (last visited Mar. 26, 2008) (addressing U.S. policy in "confronting climate change" and energy security).

239. U.S. DEPARTMENT OF STATE, USA ACTIONS TO ADDRESS, ENERGY SECURITY, CLEAN DEVELOPMENT AND CLIMATE CHANGE, *available at* http://www.state.gov/documents/organization/96165.pdf (addressing domestic and international U.S. policy on climate change) (last visited Mar. 26, 2008).

240. EPA, Council on Environmental Quality, http://www.whitehouse.gov/ceq/global-change.html#2 (last visited Mar. 26, 2008) (addressing domestic U.S. climate change policy); *see also* Control of Emissions From New Highway Vehicles and Engines, 68 Fed. Reg. 52,922, 52,925 (Sept. 8, 2003). In explaining why it should not regulate automobile emissions, the EPA stated that President Bush has "established a comprehensive global climate change policy designed to . . . take sensible steps in the interim to reduce the risk of global climate change." *Id.*

241. Pawa & Krass, *supra* note 63, at 461.

242. The fact that the United States does not agree with the proposals made under the Kyoto Protocol does not inveigh the premise that the Unites States has an overall emissions reduction policy. Federal policies can be inferred. *See* Klinghoffer v. S.N.C. Achille Lauro Ed Altri-Gestione Motonave Achille Lauro In Administrazione Straordinaria, 937 F.2d 44, 50 (2d Cir. 1991) ("given the Executive Branch's repeated condemnation of international terrorism, we believe that any initial policy that might conceivably be required has already been made.").

243. 127 S. Ct. 1464 (2007) (Roberts, C.J., dissenting).

244. Alice Kaswan, *Climate Change and the Courts*, 28 NO. 5 ANDREWS ENVTL. LITIG. REP. *12 (2007). Professor Kaswan explains that our country has a "long tradition of relying on the courts to make important policy determinations" when courts are faced with common law claims.

should be more socially efficient means of assigning and allocating CO_2 caps, imposing timelines for the development of pollution control equipment, and reconciling both with U.S. policy, rather than through litigation. Furthermore, they might feel that the elected political branches should take action, and that party politics informs climate change policy.

Yet acknowledging that climate policy is "political" in nature does not counsel in favor of using the political question doctrine to subvert climate cases due to some perceived lack of initial policymaking by the elected branches. A "political" issue and a "political question" are two different things. The former allows judicial oversight; the latter suggests that overriding separation of powers concerns warrant judicial restraint. Because climate change claims involve public, domestic and foreign policy and political matters, "it is tempting to jump to the conclusion that such claims are barred by the political question doctrine."[245] Yet as the Supreme Court observed when it adopted the modern test for identifying non-justiciable political questions, "'it is error to suppose that every case or controversy which touches foreign relations lies beyond judicial cognizance.'"[246]

V. GENERAL CRITICISMS OF APPLYING THE POLITICAL QUESTION DOCTRINE TO CLIMATE CASES

Applying the political question to climate cases warrants additional criticism surrounding whether the doctrine is constitutionally legitimate, consistent with the role of the courts, and consonant with regular rejection of the doctrine in other contexts.

A. Basic Illegitimacy of the Political Question Doctrine

While extensive critical exegesis of the doctrine's origins and justifications is beyond the scope of this article, it is important to appreciate that it has invited wide criticism. First, the doctrine itself is not tethered to any language in the Constitution. Inherently a matter of constitutional theory and interpretation, the political question doctrine seems at war with the text of the Constitution, which grants federal courts "judicial authority" to resolve "cases and controversies" without any mention of limitation as to "political questions."[247] Hence, the political question is a gloss on judicial authority in a separation of powers rubric; the Constitu-

245. *Id.* at *15 (internal quotations and citations omitted).
246. *Id.* at *15-16 (quoting Baker v. Carr, 369 U.S. 186, 211 (1962)).
247. U.S. CONST. art. III, § 2, cl. 1.

tion does not admit of any jurisdictional bar to prevent federal courts from ruling on "political questions" or the like.[248]

Second, the doctrine seems to be inconsistent with an originalist's view of a tripartite constitutional system with coordinate legislative, executive and judicial branches "checking" each other's power.[249] To be sure, 200 years ago in the nation's quintessential "political" case, Chief Justice John Marshall famously wrote that "[i]t is emphatically the province and duty of the [courts] to say what the law is."[250]

Third, the doctrine is unnecessary. There is no constitutionally-founded reason for federal courts to duck controversial issues so as to protect the legitimacy of the court's decisions: "[T]he federal courts' legitimacy is quite robust, [] there is no evidence that particular rulings have any effect on the judiciary's legitimacy, and [] in any event, the courts' mission should be to uphold the Constitution and not worry about political capital."[251]

Fourth, the doctrine is incongruous with political theory that extols judicial restraint in the face of action by the elected branches. It instead "confuses deference with abdication."[252] Thus, despite marking what most consider is the nation's quintessential "political" case, the Court in *Marbury v. Madison* did not evoke the political question doctrine in reaching the issue of whether Mr. Marbury was entitled to the commission awarded him by President Adams that James Madison, President Jefferson's Secretary of State, refused to serve.[253]

Fifth, at least applied to stop state action, it seems to work a rent in the fabric of federalism. States have long turned to federal courts to help resolve disputes with other states, with industry and with individuals. The political question doctrine denies states the constitutional access to federal venues to address matters left unattended by the federal government. In such instances, the doctrine seems to starve the states of the ability to protect the very sovereignty and dignity the Tenth Amendment "reserved."[254]

Sixth, it fails to recognize the public/private law dichotomy in our political system. Public laws generally cannot and are not intended to provide rights and remedies for private harm. Likewise, private common

248. *See* Louis Henkin, *Is There a "Political Question" Doctrine?*, 85 YALE L.J. 597, 624-25 (1976).

249. ERWIN CHEMERINSKY, CONSTITUTIONAL LAW: PRINCIPLES AND POLICIES 131-32 (Aspen Law & Business 2d ed. 2002); *see also* LAURENCE TRIBE, AMERICAN CONSTITUTIONAL LAW viii (2d ed. 1988) ("The highest mission of the Supreme Court . . . is not to conserve judicial credibility.").

250. Marbury v. Madison, 5 U.S. (1 Cranch) 137, 177 (1803).

251. CHEMERINSKY, *supra* note 249, at 132.

252. *Id.*

253. *Marbury*, 5 U.S. (1 Cranch) at 146-47.

254. U.S. CONST. amend. X.

law is not foreclosed when the elected branches have failed sufficiently to provide private redress.

B. Inconsistency with Federal Judicial Functions

The reasoning exhibited in the *American Electric Power* and *General Motors* cases seems unduly solicitous of the elected branches. It leaves little, if any, judicial role in resolving complex tort actions based on transboundary pollution problems in the absence of action by the elected branches—even though such circumstances are those in which judicial involvement is most apropos. The negative manifestations of this undue deference to the political branches in climate cases are sixfold.

First, it endorses judicial abdication as a legitimate response to legislative and executive impotency. Responses to climate change invite responses by "virtually every sector of the U.S. economy," and they are not limited solely to congressional and executive responses.[255] As Professor Kaswan notes:

> The courts' use of the political-question doctrine not only creates the threat of a legal vacuum when the political branches are paralyzed, it also ignores the common law's critical role in the evolution of the law. As victims respond to serious environmental problems by going directly to the courts, they create political pressure for more comprehensive and appropriate legislative solutions. Historically, the threat of common law liability gave affected industries an incentive to support, rather than resist, more comprehensive environmental regulation by the political branches.[256]

Second, it assumes too much by deciding that inaction in the political branches equates to a policy decision.[257] This reasoning strips the courts of jurisdiction in all matters in which Congress and the Executive are at a standstill. On the contrary, lack of action in the elective branches may just as readily suggest the opposite result, that is, it is for the courts, and not Congress and the President, to fulfill their traditional interstitial role of providing common law relief in those instances where statutory or regulatory relief is not available.

This reasoning also seems inherently inconsistent. While the court in *American Electric Power* found inaction in the political branches to be indicative of a need for initial policy by the elected branches, the court in *General Motors* seemed to conclude that inaction suggests that the politi-

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255. Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265, 273 (S.D.N.Y. 2005).

256. Kaswan, *Climate Change and the Courts*, *supra* note 244 at *12 ("The very complexity of the issues at stake, and the power of the affected interest groups, could hobble political responses for some time. Courts do not have the luxury of delay.").

257. *Id.*

cal branches have already made an initial policy determination to which the courts should defer: "The political branches' actions and deliberate inactions in the area of global warming further highlight this case as one for nonjudicial discretion."[258] Moreover, the court seemed to conclude that once the elected branches "addressed the issues" of global climate change—no matter how—the courts are rendered powerless:

> An examination of the political branches' consideration of the issues surrounding global climate change counsels against an initial policy determination to be made by the courts. As early as 1978, and as recent as the current administration, the elected branches of government have addressed the issues of climate change and global warming. . . . [R]eductions in carbon dioxide emissions is an issue still under active consideration by those branches of government.[259]

Third, it reflects a false presumption that a problem that vexes the other branches is indicative of one in which the court should avoid the political thicket: "Looking at the past and current actions (and deliberate inactions) of Congress and the Executive within the United States and globally in response to the issue of climate change merely reinforces my opinion that the questions raised . . . are non-judiciable political questions."[260]

Fourth, it incorrectly assumes that political paralysis in the elected branches is due deference. Yet courts are not only permitted to adjudicate a dispute involving a matter already subject to public law. On the contrary, private law causes of action are an important element in our federal and state adjudicative machinery.

Fifth, reliance on *Massachusetts v. EPA* to support the doctrine's application to climate seems dubious at best. If anything, *Massachusetts v. EPA* reinforces rather than reduces state authority to address climate change. For example, rather than interpreting the "special solicitude" analysis in *Massachusetts v. EPA* to support climate cases, the court in *General Motors* held that it provides "convincing force" in support of just the opposite.[261] Furthermore, rather than reading *Massachusetts v.*

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258. California v. Gen. Motors Corp., No. 3:06-CV-05755 MJJ, 2007 WL 2726871, at *24 (N.D. Cal. Sept. 17, 2007).

259. *Id.*

260. *Am. Elec. Power Co.*, 406 F. Supp. 2d at 273.

261. *Gen. Motors Corp.*, 2007 WL 2726871, at *36-37 (internal citations omitted). The court observed:

> [T]he Supreme Court's analysis on the issue of standing counsels with convincing force to the contrary. As noted above, a State has standing to pursue its "procedural right" through administrative channels, and if necessary, to "challenge the rejection of its rulemaking petition as arbitrary and capricious" as did the plaintiffs in *Massachusetts.* Unlike the procedural posture of *Massachusetts,* the current case is not before the Court by way an administrative challenge to an EPA's decision, but rather as an interstate global warming damages tort claim. Plaintiff's argument essentially ignores this procedural distinction.

EPA to suggest that the elected branches have made "initial policy determinations" about global climate change, it reached the opposite result,[262] utterly ignoring the first paragraph of Chief Justice Roberts' dissenting opinion.

Last, it improperly concludes that federal courts should steer clear of factually complex cases involving transboundary pollution. In *American Electric Power*, for example, the court was unwilling to impose pollution control requirements for what would have been hundreds of coal, oil and gas fired facilities of various ages and geographic distribution. Yet this seems to run counter to a rich history of cases in which federal courts have imposed injunctions in cases involving transboundary pollution,[263] even those subject to international negotiations and treaties[264] described above. This point is especially poignant insofar as the Supreme Court found that the tradition of federal courts hearing state common law causes of action for public nuisance supports its decision that states are entitled to "special solicitude" for standing purposes. Such solicitude seems to evaporate, however, when the common law cause is one in public nuisance for climate change.

C. Inconsistency with Reasoning in Other Contexts

Using the political question doctrine to hinder federal common law causes of action to address climate change is also inconsistent with applied jurisprudence in other contexts, particularly involving transboundary pollution for which Congress has not provided equitable or legal relief authority.[265] For example, in In Re *Methyl Tertiary Butyl Ether Products Liability Litigation*,[266] the plaintiffs brought a public nuisance claim due to groundwater contamination from Methyl Tertiary Butyl Ether (MTBE) and Tertiary Butyl Alcohol (TBA). The defendants claimed the political question doctrine barred the action, based on the

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Id.

262. *Id.* at *37 (internal citations omitted). Here, the court says:

> Similarly, the Court finds Plaintiff's attempt to equate this Court's decision on justiciability with the EPA's decision on whether to regulate carbon dioxide emissions to be problematic. The EPA's global warming carbon dioxide policymaking determinations are statutorily governed by the CAA, and are therefore not analogous the justiciability principles which govern the issues now before the Court.

Id.

263. Brenner, *supra* note 67, at 421.

264. *Am. Elec. Power Co.*, 406 F. Supp. 2d at 273 n.9.

265. *See, e.g.*, McMahon v. Presidential Airways, Inc., 502 F.3d 1331, 1364-65 (11th Cir. 2007) ("As the case appears to be an ordinary tort suit, there is no impossibility of deciding without an initial policy determination of a kind clearly for nonjudicial discretion.") (internal quotations omitted); Klinghoffer v. S.N.C. Achille Lauro Ed Altri-Gestione Motonave Achille Lauro In Administrazione Straordinaria, 937 F.2d 44, 49 (2d Cir. 1991) ("The fact that the issues before us arise in a politically charged context does not convert what is essentially an ordinary tort suit into a nonjusticiable political question.").

266. 438 F. Supp. 2d 291 (S.D.N.Y. 2006).

"'relevant economic, environmental, energy and security interests implicated by plaintiffs' effort to ban MTBE.'"[267]

The court rejected this argument. As with GHGs, it noted that Congress had studied but did not regulate the use of MTBE and TBA.[268] It drew a distinction between judicial policymaking and judicial review of cases and controversies: "[d]efendants have blurred the line between a determination of whether defendants are liable for water pollution . . . and a policy determination regarding the composition of the country's fuel supply."[269]

Similarly, in *McKay v. United States*[270] landowners brought a suit against a nuclear weapons facility. In reversing the lower court's dismissal on political question grounds, the Tenth Circuit explained that "political aspects present in . . . the decision to manufacture nuclear components [does not] rule out all the possible remedies which are available to people who are physically hurt or materially hurt."[271] Succinctly, the court concluded, "the political question theory . . . [does] not [] prevent individual tort recoveries."[272]

This is especially true for cases, like *General Motors*, where the plaintiffs seek money damages. For example, in *Koohi v. United States*,[273] the Ninth Circuit determined that the political question doctrine is not implicated in tort claims where the "plaintiff[] seek[s] only damages for [its] injuries."[274] Instead of turning the case away under the political question doctrine, it held that "[d]amage actions are particularly manageable."[275]

All of this suggests that the political question doctrine is not well suited to disable the use of federal common law causes of action for climate change.

CONCLUSION

The effects of climate change are disproportionately absorbed by states, individuals, and discrete, insular minorities and others who are compromised in the democratic bazaar. Federal common law causes of action for public nuisance provide a potential means for addressing these effects. Nonetheless, electing not to "enter the global warming thicket," some federal courts have incorrectly invoked the political question doc-

267. *Id.* at 300 (citation omitted).
268. *Id.* at 301.
269. *Id.* at 300; *see also Klinghoffer*, 937 F.2d at 49 (distinguishing between political assessment of terrorism and allocation of liability).
270. 703 F.2d 464, 465 (10th Cir. 1983).
271. *Id.*
272. *Id.* at 470.
273. 976 F.2d 1328 (9th Cir. 1992).
274. *Id.* at 1332.
275. *Id.*

trine in declining to entertain common law causes of action for public nuisance seeking abatement or damages for the effects of climate change. This article concludes that these courts have been too quick to embrace the idea that the doctrine serves as a bar to such actions. There is no constitutional or prudential justification for relegating climate change entirely to the political branches. The political question doctrine does not prevent courts from entering this thicket.

REDUCING GREENHOUSE GASES THROUGH CARBON MARKET

GARY BRYNER†

INTRODUCTION

This article explores the challenges facing governments in creating a market for carbon dioxide (and other greenhouse gases, or GHGs), offers some suggestions for how that market might best be created and managed, and suggests how the creation of a carbon market helps us better understand the role of governments in making sure that markets reflect more of the true costs of the goods that are exchanged in those markets than typically occurs. It addresses four questions: (1) How are Carbon Emissions Market Externalities? (2) How Can Markets Reflect the True Costs of Carbon Emissions? (3) What Is Required for an Effective Carbon Cap-and-Trade Program? and (4) How Can Carbon Trading Help Make Markets Work More Effectively?

I argue that, in an economic system that largely relies on markets, as the U.S. and global economies do, environmental quality is greatly dependent on our ability to design and carry out public policies that ensure prices of goods reflect all of the costs, including environmental ones, that are involved in producing, using, and disposing of goods. Our failure to ensure that markets work well—that prices accurately reflect true costs—is at the heart of most environmental problems. Once markets are working as well as we can make them, there may still be the need for policies that redistribute or otherwise alter market results, and environmental justice inquiries will be a central concern, but our primary environmental law and policy challenge is to figure out how to make markets work better.

I. HOW ARE CARBON EMISSIONS MARKET EXTERNALITIES?

Climate science is extraordinarily complex, permeated by many uncertainties about the causes, consequences, distribution, and timing of climate change. One way to try to make some sense of this remarkably complex issue is to look for conclusions drawn by groups of scientists who seek to find consensus among experts. Their reports are a much more helpful guide in developing policy responses than relying on individual studies, because the synthesis reports are, in theory at least, based on studies that have undergone additional peer review and scrutiny.

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The most important such scientific consensus-building body is the United Nations' Intergovernmental Panel on Climate Change, or IPCC.[1] In 1988, the General Assembly of the United Nations asked the World Meteorological Organization and the UN Environment Programme to create a panel of scientists to study the risk of anthropogenic climate change and to provide "balanced, objective policy advice" to governments of the world to address the threat.[2] Three working groups were established to examine (1) climate science, (2) likely impacts of climate change, and (3) options for mitigating or reducing the threat.[3] The IPCC was created in response to this request. Thousands of scientists from around the world have written reports and thousands more have served as reviewers. These scientists are nominated by their governments to serve on IPCC panels.[4] All the scientists have donated their time and none has been paid for the work completed. The reports are written by a team of authors who are recognized as leading experts in the field in which they write and work from peer-reviewed scientific and technical literature. Reports are themselves subject to broad peer review and produced through a transparent process that also involves government officials from countries around the world to agree to the summary language. Each report includes a "summary for policymakers" to ensure the analysis is relevant to the policy making process. This combination of peer reviewed science and political efforts to secure broad acceptance of the major conclusions has allowed the IPCC to bridge the worlds of science and politics.[5]

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1. The IPCC was awarded the Nobel Peace Prize in October 2007, along with former Vice President Al Gore, for its work in raising awareness around the world of the threat of climate change. Press Release, Intergovernmental Panel on Climate Change, IPCC Expresses Surprise and Gratitude at Announcement of Nobel Peace Prize (Oct. 12, 2007), http://www.ipcc.ch/pdf/press-releases/pr-12october2007.pdf.

2. *Id.*

3. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, 16 YEARS OF SCIENTIFIC ASSESSMENT IN SUPPORT OF THE CLIMATE CONVENTION 2 (2004), *available at* http://www.ipcc.ch/pdf/10th-anniversary/anniversary-brochure.pdf [hereinafter IPCC, SCIENTIFIC ASSESSMENT].

4. Union of Concerned Scientists, *The IPCC: Who Are They and Why Do Their Climate Reports Matter?*, http://www.ucsusa.org/global_warming/science/the-ipcc.html (last visited Mar. 28, 2008).

5. Since uncertainty is a key theme in the climate research reviewed by IPCC working groups, their reports seek to carefully express the amount of evidence available and the degree of agreement among scientists. The level of agreement is described from low to high, as is the amount of evidence. The level of confidence seeks to reflect agreement among scientists about the correctness of a model or analysis and the language used is as follows:

Very high confidence	at least 9 out of 10 chance of being correct
High confidence	about 8 of 10 chance
Medium confidence	about 5 of 10 chance
Low confidence	about 2 of 10 chance
Very low confidence	less than 1 out of 10 chance

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, GUIDANCE NOTES FOR LEAD AUTHORS OF THE IPCC FOURTH ASSESSMENT REPORT ON ADDRESSING UNCERTAINTIES 3-4 (2005), *available at*

The first IPCC report was submitted to the UN General Assembly in 1990 and led to negotiations that culminated in the 2002 Framework Convention on Climate Change signed by attendees of the Rio Earth Summit.[6] The report argued that there was a significant likelihood that human emissions of carbon dioxide and other heat-trapping greenhouse gas emissions were warming the average temperature of the earth and that climate-based disruptions are already occurring in different regions and will become even more disruptive in the future.[7] The fourth report or assessment, like the earlier versions, was the result of a tremendous amount of scientific effort.[8] Working Group I's February 2007 report, for example, was based on the work of some 600 contributing authors in 40 countries, more than 30,000 comments from external reviewers, and editing of the summary report for policy makers by representatives from 113 governments.[9] The report concludes that scientific research leads to a "very high confidence that the global average net effect of human activities since 1750 has been one of warming" and that "[w]arming of the climate system is unequivocal."[10]

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http://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf. Likelihood is used to reflect the probability of a particular outcome having occurred or occurring in the future. The probability range and corresponding terms used in the reports are as follows:

Virtually certain	>99% probability of occurrence
Very likely	>90% probability
Likely	>66% probability
About as likely as not	33 to 66% probability
Unlikely	<33% probability
Very unlikely	<10% probability
Exceptionally unlikely	<1% probability

These terms are used throughout IPCC reports in italics in order to make as transparent as possible the judgments made by authors about the scientific research they synthesize and assess. *Id.*

6. IPCC, SCIENTIFIC ASSESSMENT, *supra* note 3, at 1.

7. *Id.* at 3.

8. Reports issued by the UN Intergovernmental Panel on Climate Change are the most important summary assessments of climate change science. The Fourth Assessment Report, actually issued in a series of reports throughout 2007 and culminating in a synthesis report in November, includes work done by three groups: WORKING GROUP I, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, THE PHYSICAL SCIENCE BASIS (Susan Solomon et al. eds., 2007), *available at* http://www.ipcc.ch/ipccreports/ar4-wg1.htm [hereinafter WORKING GROUP I, PHYSICAL SCIENCE BASIS] (examining the interaction of human and natural factors that contribute to climate change); WORKING GROUP II, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IMPACTS, ADAPTATION, AND VULNERABILITY (Martin Parry et al. eds., 2007), *available at* http://www.ipcc.ch/ipccreports/ar4-wg2.htm (focusing on how climate change affects natural and human systems, their vulnerability to these changes, and their capacity to adapt); and WORKING GROUP III, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, MITIGATION (Bert Metz et al. eds., 2007), *available at* http://www.ipcc.ch/ipccreports/ar4-wg3.htm (examining the scientific, technological, environmental, economic, and social aspects of mitigation, including technologies and policies that are most likely to reduce the magnitude of change); *see also* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT (Rajendra K. Pachauri et al. eds., 2007), *available at* http://www.ipcc.ch/ipccreports/ar4-syr.htm [hereinafter IPCC, SYNTHESIS REPORT].

9. WORKING GROUP I, PHYSICAL SCIENCE BASIS, *supra* note 8, at v, vii.

10. *Id.* at 3, 5.

The November 2007 synthesis report stated that "[o]bservational evidence from all continents and most oceans," the authors of the report wrote, "shows that many natural systems are being affected by regional climate changes, particularly temperature increases."[11] Most of the observed increase in globally-averaged temperatures since the mid-twentieth century is *very likely* due to the observed increase in anthropogenic GHG concentrations.[12] It is *likely* there has been significant anthropogenic warming over the past fifty years averaged over each continent (except Antarctica).[13] Emissions from humans have *very likely* contributed to sea level rise, *likely* contributed to changes in wind patterns and extra-tropical storm tracks and temperature patterns, increased temperatures of extreme hot nights, cold nights, and cold days, and *more likely than not* contributed to the increased risk of heat waves, droughts, and the frequency of heavy precipitation events.[14] Anthropogenic warming over the last three decades has *likely* had a discernible influence at the global scale on observed changes in many physical and biological systems.[15] These changes are *very unlikely* to be due to natural variability.[16]

Particularly significant is the conclusion of the 2007 report that "discernible human influences now extend to other aspects of climate, including ocean warming, continental-average temperatures, temperature extremes and wind patterns" and its emphasis on *current evidence* concerning the effects of global warming, including rising arctic temperatures, sea level rise, warming of the permafrost, more intense and longer droughts, an increase in heavy precipitation events, and an increase in intense tropical cyclone activity.[17] Many climate scientists have concluded that the nature, magnitude, and extent of the impacts of global warming are so large and threatening and the atmospheric life-time of GHGs is so long that immediate action is required to begin to reduce emissions over time, that it is prudent to reduce the risk of climate change and irrational not to take preventative steps to reduce that risk. Many scientists believe the IPCC reports issued in 2007 likely understate the threats, while a few continue to argue that the risks may be overstated. The melting of ice at the poles and the collapse of ice sheets, for example, have occurred much more rapidly than scientists predicted.[18] While there are tremendous uncertainties, the unambiguous trend in the steady increase in scientific research confirms the seriousness of the

11. IPCC, SYNTHESIS REPORT, *supra* note 8, at 2.
12. *Id.* at 5.
13. *Id.*
14. *Id.* at 6.
15. *Id.*
16. *Id.*
17. WORKING GROUP I, PHYSICAL SCIENCE BASIS, *supra* note 8, at 5-10.
18. Doug Struck, *At the Poles, Melting Occurring at Alarming Rate*, WASH. POST, Oct. 22, 2007, at A10.

threat of disruptive climate change. Uncertainties can cut both ways, and the disruptions caused by growing levels of GHGs may be much greater than anticipated. Taking actions to reduce the threat, as well as helping those who must adapt to these disruptive changes, will likely be one of the most important collective tasks of the 21st century.

The 1992 Framework Convention on Climate Change (FCCC), to which most of the countries of the world, including the United States, are signatories, commits those nations to "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[19] There is no agreement on what concentration level would ensure that the FCCC goal of preventing "dangerous anthropogenic interference with the climate system" be met,[20] but leading climate scientists argue that, given the evidence that global change is already doing damage, it is not likely that "any level equivalent to more than a doubling of the pre-industrial CO_2 concentration could plausibly be considered compliant with the convention."[21] Much of the scientific debate has centered on the conclusion that temperature increase should be kept to no more than two degrees Centigrade in order to ensure that the impacts of climate change will be relatively modest. An atmospheric CO_2 concentration of 450 parts per million (ppm) (current levels are about 425 ppm) would likely be required to satisfy the FCCC goal.[22]

In order to stabilize the CO_2 concentration at 450 ppm, these scientists have concluded that emissions will need to be cut by 60-80 percent of 1990 levels by mid-century.[23] This goal is fraught with uncertainties because of feedback mechanisms that are not well understood or difficult to predict. But if the average temperature increases by more than two degrees Centigrade, scientists fear the planet would enter into uncharted waters, where the temperature would be hotter than it has been for hundreds of thousands of years and would create an environment much different than the one in which current life has evolved. The policy challenge is to regulate markets so that prices are high enough to ensure that they include the costs of keeping emissions at safe levels.

19. United Nations Framework Convention on Climate Change art. 2, May 9, 1992, 31 I.L.M. 849 (1994).

20. *Id.*

21. John P. Holdren, *The Energy-Climate Challenge: Issues for the New U.S. Administration*, ENVIRONMENT, June 1, 2001, at 8, 13, *available at* http://www.encyclopedia.com/doc/1G1-75917475.html.

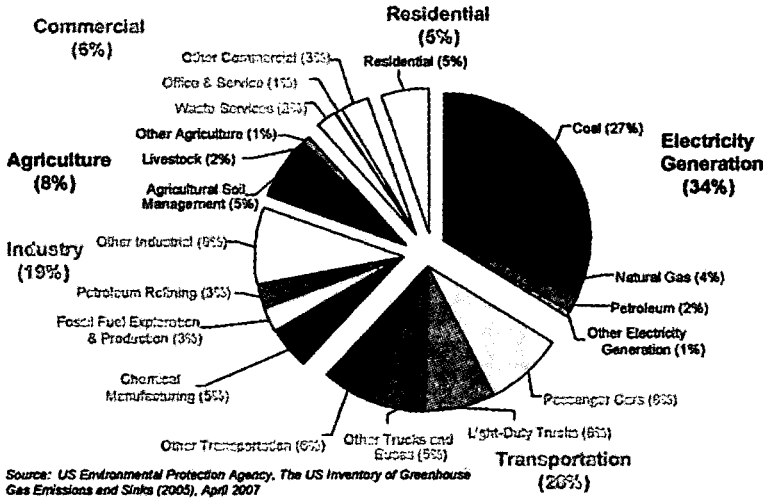
22. *Id.*

23. *Id.*

II. HOW CAN MARKETS REFLECT THE TRUE COSTS OF CARBON EMISSIONS?

Carbon emissions permeate modern economic life. Very few goods and services escape the use of electricity produced from fossil fuels or transportation powered by those fuels. The following figure, based on the Environmental Protection Agency's (EPA) inventory of greenhouse gas emissions, illustrates the broad scope of those emissions. About one-third comes from the generation of electricity; transportation sources are responsible for about 28 percent, industrial sources contribute 19 percent, and agricultural, commercial, and household sources emit the balance.[24] The EPA reports emissions in terms of teragrams of CO_2 equivalent; in 2005, total U.S. GHG emissions were 7,260 Tg CO_2, an increase of 16.3 percent since 1990 (one teragram equals 1,000,000,000,000 grams).[25] Emissions of CO_2 increased by 20.3 percent during those years, while methane and nitrous oxide emissions fell by 11.5 and 2.8 percent, respectively.[26] U.S. emissions were partly offset by carbon sequestration in biological life such as forests, urban trees, and agricultural soils that offset 11.4 percent of the total emissions.[27]

Figure 1[28]
Key Sources of Direct U.S. Greenhouse Gas Emissions by Economic Sector (2005)



24. ENVIRONMENTAL PROTECTION AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2005, at ES-14 (2007), http://www.epa.gov/climatechange/emissions/downloads06/07CR.pdf.

25. *Id.* at ES-3.

26. *Id.* at ES-4.

27. *Id.* at ES-4-6.

28. STAFF OF H.R. COMM. ON ENERGY AND COMMERCE, 110TH CONG., CLIMATE CHANGE LEGISLATION DESIGN WHITE PAPER: SCOPE OF A CAP-AND-TRADE PROGRAM 7 (2007), *available at* http://energycommerce.house.gov/Climate_Change/White_Paper.100307.pdf.

There are a number of ways we might try to reduce carbon emissions and their role in climate change. We could enact laws and implement policies that ban certain products that release high levels of carbon, as we did in enacting amendments to the Clean Air Act in 1990 to ban products that use certain chlorofluorocarbons and threaten the stratospheric ozone layer, in response to the Montreal Protocol.[29] We can reduce the release of carbon by imposing efficiency standards on sources of carbon emissions, such as the corporate average fuel efficiency (CAFÉ) standards imposed on motor vehicle manufacturers or efficiency standards for appliances, industrial equipment, lighting, and buildings.[30] We can subsidize low carbon energy sources such as wind, solar, and hydropower, and encourage people to use less energy or cleaner forms of energy through educational campaigns. We can require electricity producers to shift to cleaner burning fuels, such as natural gas, and to sequester carbon emissions rather than releasing them into the atmosphere.

We can also act to ensure that energy prices include the costs resulting from the carbon emissions from energy production and use. This approach, as well as those listed above, are not mutually exclusive. A combination of approaches can and will need to be pursued to reduce carbon emissions. But in an economic system dominated by markets, and fundamentally organized by markets, it makes a great deal of sense to focus on correcting those markets so they reflect the true costs of producing energy. Economic theory is simple, straightforward, and compelling here, and does not even require a supply and demand chart. Markets promise to produce decisions about production and consumption that reflect the interests of consumers and promote the most economically efficient use of the available resources. If markets reflect all the costs associated with goods and services, and consumers have perfect information about the costs and benefits of alternatives, then markets will be able to produce the benefits they promise. The task of law and policy is to ensure that, as much as possible, true cost prices dominate and accurate information is available, because producers also have an incentive to maximize their profits by externalizing as many costs as possible.

Well-functioning markets can also appeal to advocates of fairness and justice in that externalities impose burdens and harms on individuals who do not benefit from transactions that fail to reflect true costs; in the case of climate change, for example, they may bear some or many of the burdens such as disruptive changes to their environment, but they receive few of the benefits that buyers and sellers enjoy. Residents of island nations that are threatened by rising sea levels largely do not benefit from

29. 42 U.S.C.A. § 7671 (West 2008); Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1541.

30. The most recent energy legislation, enacted by Congress in December, 2007, included all of these measures as a way to reduce energy consumption and to reduce GHG emissions. Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492 (2007).

the jobs, salaries, air conditioning, heating, transportation, and products that also produce carbon emissions, or at least do not enjoy the benefits in proportion to the burdens they face. Reducing those externalities is a moral imperative as well as an economic one.

The two most widely discussed ways of internalizing the costs of carbon into markets are carbon taxes and carbon cap-and-trade programs. Carbon taxes can take a variety of forms, from taxes on fuels, calculated based on their carbon content, to taxes imposed on those who consume energy and other goods and services implicated in carbon emissions. Cap-and-trade programs set a ceiling or cap on total allowable emissions, allocate allowances or permits to carbon sources that set a cap on their individual emissions, and then allow the sources to meet their cap by a combination of reducing their emissions and buying excess allowances from other sources that have reduced their emissions beyond their cap and have extra allowances to sell.

Carbon taxes are an attractive policy option to help reduce GHG emissions, despite the political barriers imposed by the idea of raising taxes. If they are sufficiently high, carbon taxes can create clear incentives to reduce emissions. Unlike emission standards that, once met, provide no incentive for further innovations, taxes provide a continuous reason to find ways to reduce emissions. Taxes can raise revenue that can finance investments in energy conservation, improved efficiency, and renewable energy sources. They can help produce more efficient markets by ensuring that prices include more of the total costs of producing and using goods and services. Compared to a cap-and-trade policy, carbon taxes can be relatively simple to explain and easy to design and implement. The level of the tax can be raised and lowered as needed to ensure the necessary reductions in emissions are achieved. In sum, carbon taxes have significant benefits:

- Simpler to design and implement and easier to understand and explain;
- Can be put in place more quickly;
- Less likelihood of cheating;
- Predictability in energy prices;
- Can address more sectors of the economy;
- Creates a revenue stream that can be used to reduce other taxes or fund energy efficiency and renewables or pay for mitigation;
- Easy to adjust up or down if necessary to achieve environmental and economic goals.

Cap-and-trade approaches to reducing GHG emissions have some serious shortcomings. The compliance costs are uncertain and difficult to plan for in business and government decision making. The design of the program is complex, involving difficult choices such as at what level the cap should be set, to whom the allowances allocated under the cap should be given, whether allowances should be sold or distributed for free, and how long the allowances should last before they expire. The implementation of a program is just as daunting, requiring accurate monitoring and reporting of emissions, enforcement of allowance caps, and the imposition of sanctions for violations. Once allowances are allocated, they are difficult to retrieve if too many are distributed because their distribution can create expectations of rights of ownership that are difficult to reverse. Allocation decisions must be made within a context of uncertainty, and adjustments are difficult to make. Cap-and-trade programs have significant benefits as well:

- They do not suffer from the political opposition generated by calls to raise taxes;
- Cap-and-trade programs like acid rain have been successful in achieving their goals at lower cost than expected;
- They can be integrated with international cap-and-trade programs;
- Allowances can be auctioned to fund clean energy projects;
- If accurately set, the cap ensures environmental protection goals are achieved; carbon tax may not achieve that goal;
- The resulting market sets the price of carbon, and channels resources to projects more efficiently.

There are tremendous challenges involved in designing and implementing an effective cap-and-trade program to reduce the threat of climate change. But if those challenges can be addressed, it is an important part of the overall effort to reduce the threat of climate change. A cap-and-trade approach focuses on the key issue of what is required in order to secure a healthy environment. While it is difficult to know what exactly the cap should be, it focuses attention on the need to make policy decisions based on the best scientific evidence we have. Contrary to the argument made by tax advocates that we need policies with fixed economic costs and who reject cap-and-trade because the costs are uncertain, we need to give priority to trying to determine what is required to secure a stable climate, rather than setting an arbitrary limit on the amount of money to be spent on climate stabilization. Cap-and-trade discussions begin with the right question, even if the answer is not always clear.

As is true of a carbon tax, a cap-and-trade program seeks to ensure that markets reflect true costs. A carbon tax that reflects the true cost of

emitting carbon in producing goods and services would help achieve that purpose, but it is difficult to know what level of taxation does that. If a cap is well enough designed so that it will achieve the environmental goal, it then establishes a market mechanism for determining true costs. Prices for goods and services containing carbon, for example, if they are determined in a market shaped by such a carbon cap, will reflect at least the climate change-related costs. One major problem here, of course, is that there is not an unambiguous cap for climate change; there is no point at which we shift from no climate change to climate change, but it is a matter of degree. But we do have an emerging agreement among climate scientists, discussed above, that, at least for now, our goal ought to be an 80 percent reduction in GHG levels, from 1990 levels, by 2050, in order to keep the concentration of GHGs at no more than 450 ppm and the temperature rise at no more than two degrees Centigrade.[31] Setting the cap there, then auctioning allowances to all sources so that total emissions do not exceed the cap, allows markets to allocate scarcity in the most economically efficient manner, and avoids the very difficult political challenge of allocating emission allowances. Again, this is an imprecise calculation, fraught with difficulties and uncertainties, but it focuses attention on securing environmental quality and then using markets to achieve that goal, rather than putting an economic goal first.

Industries typically favor trading programs rather than taxes because trading programs usually distribute allowances for free. Taxes represent clearly visible cost increases, and most politicians also shy away from them. If a carbon tax could be uniformly applied to create a level playing field, it might be attractive to industries because it would make their compliance efforts much simpler than a cap-and-trade scheme. But a carbon tax would reward some industries and fuels, while penalizing others, and the creation of winners and losers make the politics of designing a carbon tax very dicey. Both cap-and-trade and carbon tax policies are difficult to design and implement in the face of powerful interests' ability to exert political pressure.

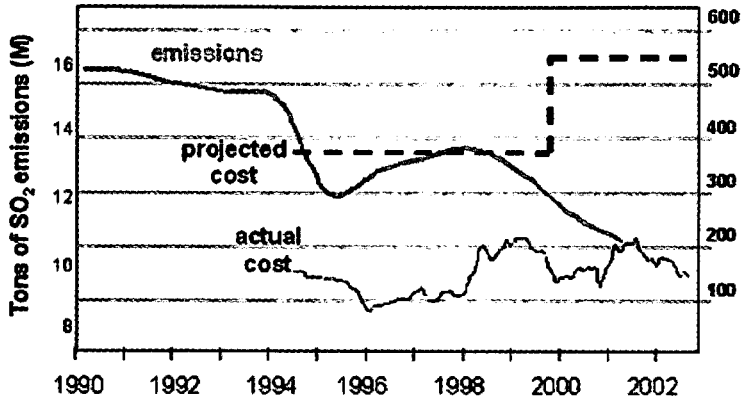
III. WHAT IS REQUIRED FOR AN EFFECTIVE CARBON CAP-AND-TRADE PROGRAM?

Carbon trading programs typically trace their origins to the federal acid rain program. The Clean Air Act of 1990 established a cap-and-trade system to reduce acid rain-producing emissions from coal-fired power plants.[32] The heart of the acid rain emissions trading system is the idea of a cap on total emissions projected, by the year 2010, to result in a reduction of sulfur dioxide emissions of ten million tons from 1980 levels.[33] The targets of the acid rain program are likely to be met, and at a

31. *See supra* note 24 and accompanying text.
32. *See* 42 U.S.C.A. §§ 7401-7671q (West 2008).
33. *Id.* § 7651.

much lower cost than expected if the cap-and-trade program had not been developed and implemented. The following figure summarizes the success of the acid rain program. Research suggests that the problem of acid deposition is far from solved, and that many lakes, streams, and forests continue to suffer from the effects of sulfur dioxide emissions. The problem requires further study but it appears that the cap may have been too low, or the goal of one cap may not adequately take into account the variety in the susceptibility of different areas to the effects of acid rain.[34] These problems highlight how critical it is to devise a cap that will ensure the environmental goal is achieved, and that is no small task for climate change.

Figure 2[35]
The U.S. Acid Rain Program



In the United States, carbon cap-and-trade proposals are being developed at the regional and national level. The Northeastern states and Eastern Canadian provinces have formed the Regional Greenhouse Gas Initiative (RGGI) that is a cap-and-trade program for power plants.[36] The Midwest GHG Accord (MW GHG Accord), involving northern Midwest states, is in its earliest stages.[37] The Western Climate Initiative (WCI), also early in its development, is developing a cap-and-trade program for Western states and provinces.[38] In Congress, the leading carbon cap-and-trade bill is the Lieberman-Warner bill, passed by the Senate

34. ELLEN BAUM, CLEAN AIR TASK FORCE, UNFINISHED BUSINESS: WHY THE ACID RAIN PROBLEM IS NOT SOLVED 1 (2001), http://www.catf.us/publications/reports/Acid_Rain_Report.pdf (explaining that acid rain is still a problem for Atlantic salmon populations in Nova Scotia, lakes in Canada and New York, streams in Virginia, fish diversity in Northern Pennsylvania, and red spruce and sugar maples in the Northeast).

35. Environmental Defense Fund, *The Cap and Trade Success Story*, http://www.edf.org/page.cfm?tagID=1085 (last visited Mar. 28, 2008).

36. *See* Regional Greenhouse Gas Initiative, http://www.rggi.org/ (last visited Mar. 28, 2008).

37. *See* MIDWESTERN GOVERNORS ASSOCIATION, MIDWESTERN GREENHOUSE GAS ACCORD (2007), *available at* http://www.midwesterngovernors.org/resolutions/GHGAccord.pdf.

38. *See* The Western Climate Initiative, http://www.westernclimateinitiative.org/ (last visited Mar. 28, 2008).

Environment & Public Works Committee in December 2007, and awaiting further action in 2008.[39] Several bills have been introduced in the House, but had not been reported out by a committee as of February 2008. The leading committee with jurisdiction over the issue is the House Energy & Commerce Committee. To move the debate forward, the Committee is issuing a series of white papers; the first paper, issued in 2007, focuses on the design of a carbon cap-and-trade program.[40]

The most developed carbon program is the European Union Emissions Trading System (EU ETS).[41] The EU is made up of 27 member states. Its powers are more limited than that of the U.S. federal government; the EU issues directives and members and member states enact laws and issue regulations that bind sources within their boundaries. Phase I of the EU ETS was a pilot phase, from 2005-07;[42] in 2008, phase II began.[43] It is a binding program designed to help the EU meet its GHG reduction target under the Kyoto Protocol, which takes effect from 2008-12.[44] The progress so far in developing or implementing these trading programs provides a number of important lessons to guide a discussion of what we should focus on in designing an effective carbon trading program.

Pre-empting States. One key question is whether there should be a national trading system or whether we should encourage regional programs. A national system is essential in developing an effort that engages the entire country, but in the absence of a federal program, regional programs provide opportunities to experiment with alternative approaches. A major problem with regional programs is that they may reduce emissions within the participating states, but emissions may increase outside of the boundaries. For example, if states agree to limit production of electricity from conventional coal-fired power plants, power from such plants might continue to be produced outside the system. If the regional program is designed to incorporate all of the states within an electricity transmission network, this problem of leakage can be minimized. More broadly, a national carbon trading program can allow states to continue to experiment, but careful coordination is re-

39. America's Climate Security Act of 2007, S.B. 2191, 110th Cong. § 4(7) (2007), *available at* http://lieberman.senate.gov/documents/acsabill.pdf.

40. STAFF OF H.R. COMMITTEE ON ENERGY AND COMMERCE, CLIMATE CHANGE LEGISLATION DESIGN WHITE PAPER: APPROPRIATE ROLES FOR THE DIFFERENT LEVELS OF GOVERNMENT (2008), *available at* http://energycommerce.house.gov/Climate_Change/white%20paper%20st-lcl%20roles%20final%202-22.pdf.

41. *See* European Union Emissions Trading System, http://www.euets.com/ (last visited Mar. 28, 2008).

42. Judit Zegnál, *EC Toughens up for Next Phase of Emission Trading*, European Union Emissions Trading System, Oct. 16-22, 2006, *available at* http://www.euets.com/index.php?page=news&newsid=42&l=1.

43. *Id.*

44. *Id.*; *see also* Kyoto Protocol to the United Nations Convention on Climate Change, Dec. 10, 1977 37 I.L.M. 22 (2007).

quired to ensure regional systems develop common approaches that can eventually be integrated.

This is part of a broader question of whether a state carbon program, to include regulatory standards such as emission limits on motor vehicles, should be preempted by federal legislation. The Senate bill protects state innovations from federal preemption, while Chairman of the House Energy & Commerce Committee John Dingell (D-MI) strongly favors preempting states in order to have one national standard.[45] Most industry groups have lobbied hard for a national standard, but state authority is critical in allowing states to continue to experiment with alternative approaches and to promote policy innovation.

Developing Accurate Inventories. Another key issue is the development of an accurate inventory in order to determine the allocation of allowances and selecting a baseline from which reductions are calculated. On May 8, 2007, more than 30 states signed on as charter members of The Climate Registry, a collaboration aimed at developing a common system for entities to report greenhouse gas emissions.[46] Canadian provinces and Native American nations have joined the effort.[47] There are a host of important issues involved in fashioning accurate GHG inventories. For example, the World Business Council for Sustainable Development and the World Resources Institute's Greenhouse Gas Protocol Initiative suggests the following principles to guide GHG accounting and reporting:

- Define boundaries that appropriately reflect the GHG emissions of the business and the decision-making needs of users.

- Account for all GHG emissions sources and activities within the chosen organizational and operational boundaries. Any specific exclusions should be stated and justified.

- Allow meaningful comparison of emissions performance over time. Any changes to the basis of reporting should be clearly stated to enable continued valid comparison.

- Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Important assumptions should be disclosed and appropriate references made to the calculation methodologies used.

45. STAFF OF H.R. COMMITTEE ON ENERGY AND COMMERCE, *supra* note 40, at 25.

46. Press Release, The Climate Registry, *Dozens of States Join the Climate Registry to Track Greenhouse Gas Emissions* (May 8, 2007), *available at* http://www.theclimateregistry.org/The_Climate_Registry_Press_Release.pdf.

47. *Id.*

- Exercise due diligence to ensure that GHG calculations have the precision needed for their intended use, and provide reasonable assurance on the integrity of reported GHG information.[48]

Another challenge is defining and verifying emissions throughout the life cycle of a product. Emissions can occur from the processing of raw materials purchased for manufacturing, as a result of the production of the electricity used in manufacturing components, and from the transportation, use, and disposal of products, and from other activities. These complex calculations must be broad and inclusive to ensure emissions are not excluded.[49] Reporting and monitoring mechanisms need to be efficiently integrated with requirements under environmental laws in order to minimize the costs of participating in the program.

Determining the benchmark is also difficult. The generation of GHG reduction credits is based on the calculation of the level of GHGs that would have been emitted in the absence of a project. This is a hypothetical figure that is difficult to calculate. There is a strong incentive for sources and nations to inflate their GHG inventory in order to be in a position to claim more reduction credits. Governments may be hard

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48. WORLD RESOURCES INSTITUTE, THE GREENHOUSE GAS PROTOCOL: A CORPORATE ACCOUNTING AND REPORTING STANDARD 7 (2001), http://www.wbcsd.org/web/publications/ghg-protocol.pdf. A related issue centers on defining the boundaries of a firm's emissions. The World Resources Institute report suggests that companies use organizational boundaries for determining GHG emissions responsibility that are consistent with boundaries established for financial reporting. *Id.* at 14-15. They recommend that emission inventories include emissions over which companies have "significant control" and represent direct emissions as well as indirect ones resulting from the electricity they purchase. *Id.* at 43. Control is defined as "the ability of a company to direct the operating policies of another entity/facility. Usually, if the company owns more than 50 percent of the voting interests, this implies control." *Id.* at 15. Significant influence is a function of the following factors: (1) "the company owns voting interests of between 20 and 50 percent"; (2) "the company has the power to participate in the entity's/facility's financial and operating policy decisions"; and (3) "the company has a long-term interest in the entity/facility." *Id.* The reports recommend the following emissions be reported, as determined by the specific business and industry context and based on accepted financial and accounting standards:

- All GHG emissions from those entities/facilities which are defined as being controlled—wholly owned and not wholly owned but controlled;
- The equity share emissions from jointly controlled assets/entities; and
- The equity share of emissions from entities/facilities over which the reporting company has significant influence but does not control.

Id. at 15-16.

Direct emissions include production of electricity, heat, and steam; physical or chemical processing; transportation of materials, products, waste, and employees; and fugitive emissions. *Id.* at 21. Indirect emissions include emissions associated with the generation of imported or purchased electricity, heat, and steam, and should be reported separately. *Id.* Other indirect emissions that could be reported include employee business travel; transportation of products, materials, and waste; outsourced activities, contract manufacturing, and franchises; emissions from waste generated by the reporting company that actually occur at other sites not owned by the company, such as methane from landfills; emissions from the use and end-of-life phases of products and services produced by the reporting company; employees commuting to and from work; and production of imported materials. *Id.*

49. *See* CHRISTOPHER P. LORETTI ET AL., PEW CENTER ON GLOBAL CLIMATE CHANGE, AN OVERVIEW OF GREENHOUSE GAS EMISSION VERIFICATION ISSUES 39 (2001), http://www.pewclimate.org/docUploads/emissions_verification.pdf.

pressed to be able to calculate accurate baselines. There will be strong incentives to establish generous baselines and credits. The calculation of credits requires certifying bodies to be able to ensure that reductions are permanent and additional. Should projects aimed at reducing local air pollution be eligible for funding as a source of GHG credits? Should projects planned for other reasons be part of the baseline? Should governments be able to claim credits for reducing subsidies, reforming prices, deregulating economic sectors, and restructuring energy production?

Setting a Cap. Setting the cap on total emissions is a critical decision. Deciding what GHGs to include is critical here. Most trading programs just include CO_2; the Senate bill includes all six GHGs.[50] One option is to aim for the goal of an 80 percent reduction by 2050, with intermediate goals or benchmarks to ensure progress. A number of states have already set caps, and the size of the caps and deadlines vary greatly, as shown in the following table:

Table 1[51]
GHG Caps and Dates

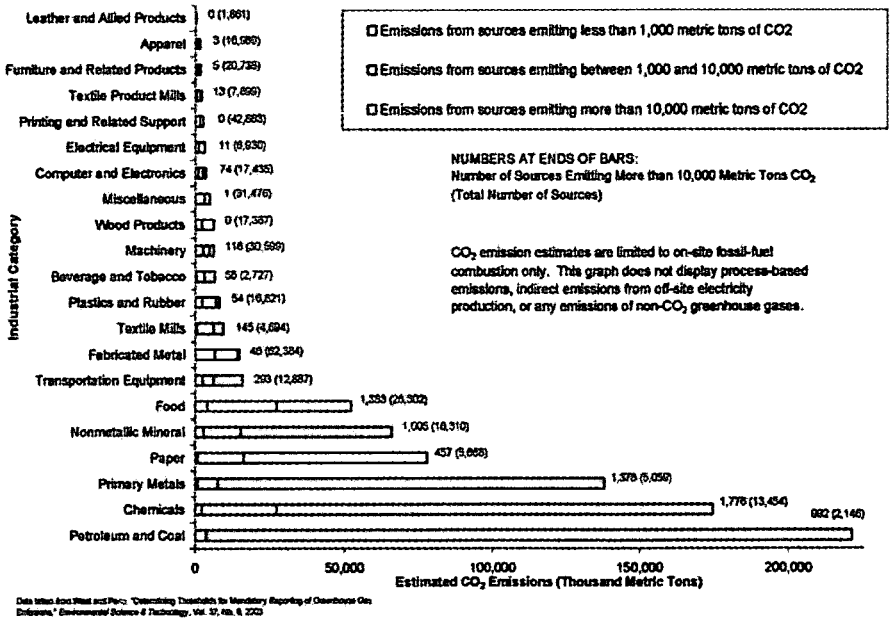
Year	Cap
2100	75% cut: RI
2050	75-80% cut: CA, CO, CT, FL, MA, ME, MN, NJ, NM, OR NH & VT, no date 50-60% cut: AZ (by 2040), IL, WA
2035	25% below 1990 levels: WA
2025	back to 1990 levels: FL; back to 2000 levels: VA; 30% cut: MN
2020	back to 2000 levels: AZ; back to 1990 levels: CA, HI, IL, NJ, WA 10% cut below 1990 levels: MA, ME, NM, NY, OR, RI, VT; 20% cut below 2005: CO
2017	back to 2000 levels: FL
2015	15% cut: MN
2012	back to 2000 levels: NM
2010	back to 2000 levels: CA; back to 1990 levels: CT, MA, ME, NH, RI, VT

50. America's Climate Security Act of 2007, S.B. 2191, 110th Cong. § 4(15) (2007), *available at* http://lieberman.senate.gov/documents/acsabill.pdf.

51. PEW CENTER ON GLOBAL CLIMATE CHANGE, CLIMATE CHANGE 101, STATE ACTION 3, 7, *available at* http://www.pewclimate.org/docUploads/101_States.pdf (last visited Mar. 28, 2008).

Determining Who Is Required to Hold Allowances. RGGI only applies to fossil-fuel fired electric generating units ≥ 25 megawatts (Mw) of power.[52] The EU ETS regulates downstream installations—those that actually release emissions. This includes 11,500 large stationary sources and installations; motor vehicles are not included; airplanes may be added later.[53] The Senate bill covers 87 percent of total emissions; the House bill focuses on large sources.[54] While there are hundreds of thousands of GHG emitters, most of the emissions come from major sources, so the regulatory task is not quite as daunting as it might appear, as demonstrated by the following figure.

Figure 3[55]
Large Emitters of CO_2 from Fossil Fuel Combustion in Each Manufacturing Industry



Allocating Initial Allowances. A major issue is whether allowances should be auctioned or distributed for free. Auctioning allowances has

52. REGIONAL GREENHOUSE GAS INITIATIVE MODEL RULE at 21 (2007), *available at* http://www.rggi.org/docs/model_rule_corrected_1_5_07.pdf.

53. Peter Zapfel, European Commission, *Webinar Regarding the EU Emission Trading Scheme*, *available at* www.climatechange.utah.gov/docs/Webinar_5.ppt (last visited Mar. 28, 2008).

54. America's Climate Security Act of 2007, S.B. 2191, 110th Cong. §§ 3101, 3201 (2007), *available at* http://lieberman.senate.gov/documents/acsabill.pdf.

55. STAFF OF H.R. COMMITTEE ON ENERGY AND COMMERCE, *supra* note 40, at 17.

many advantages. Allowances are allocated through a market mechanism, promoting their efficient allocation. Sources that have reduced emissions voluntarily are not punished, because they now need to purchase fewer allowances, while those that have put off reductions have to buy more. The revenues from the auctions can be used to subsidize emissions-reducing activities, fund research and development, help meet adaptation costs, and for other relevant purposes. Auctions can raise prices of high-emitting processes and facilities and encourage reductions. But auctions are strongly opposed by industries that naturally prefer their free distribution, and many carbon trading programs anticipate an initial free distribution, with auctions to come later. RGGI is proposing at least 25 percent of the allowances be allocated for consumer benefit and/or strategic energy purpose (end use energy efficiency) and 75 percent be left up to states.[56] Under the EU ETS, national allocation plans distribute allowances; up to five percent were auctioned in phase I; up to 10 percent in phase II.[57] The Senate bill gives less than 50 percent of allowances to states for load serving electricity generating entities and farmers and foresters for sequestering; the balance goes to regulated sources; 15 years into the program, over 70 percent are to be auctioned; the balance are to be given to states and entities above, and not to specific facilities.[58]

Determining Whether to Allow Offsets. Offsets are allowances or credits that regulated entities can purchase by investing in projects that emit fewer GHGs, such as electricity-generating windmills, or that sequester carbon, such as tree plantations. Sources may find it cheaper to pay for these offset programs than to reduce their emissions. From the perspective of economic efficiency, for example, trading should be as broad as possible and be open to as many parties as possible. But trading also poses the problem of appearing to allow sources to buy credits from others rather than reducing their emissions. There are also concerns that trading will allow sources to invest in carbon sequestration projects with uncertain or only temporary benefits rather than actually reducing their emissions.

Projects aimed at reducing GHG emissions or increasing carbon sinks may create incentives for increased emissions/decreased sinks elsewhere. For example, if some sources shift away from using coal, that might deflate coal prices and stimulate increased use by others. Carbon sequestration may be pursued through investments in plantations that displace farmers and encourage them to move to other areas and cut down trees for croplands. One of the cheapest ways of generating GHG credits is to invest in the protection or expansion of carbon sinks, such as

56. RGGI, OVERVIEW OF RGGI 4, http://www.rggi.org/docs/mou_rggi_overview_12_20_05.pdf (last visited Mar. 28, 2008).

57. EU ETS, Auction 2006, The Auction's Legislative Background, http://www.euets.com/index.php?page=75&l=1 (last visited Mar. 28, 2008).

58. §§ 3101, 3201.

planting trees and no-till cultivation. But this raises numerous problems, such as how to determine what the baseline is of carbon sequestration before a project is pursued, so that credits can be accurately calculated.

Under RGGI, offsets are limited to specific kinds of projects, independent verification is required, and they can come from other RGGI states or other states that have signed memoranda of understanding with RGGI officials.[59] Each source may cover up to 3.3 percent of its total obligation with offsets; if prices reach $7/ton, offsets can satisfy five percent of total obligations; if they reach $10/ton, offsets can be used for up to 10 percent of the obligation.[60] Offsets under the EU ETS are governed by the Kyoto Protocol, which requires that offsets are permanent, verifiable, and additional (beyond business as usual and clearly demonstrated to be an additional step taken expressly to reduce GHGs).[61] No offsets are allowed for nuclear power or carbon sinks; limited offsets are available for hydropower, and all offsets must be less than 13.5 percent of the national cap.[62] The Senate bill allows sources to meet up to 15 percent of their cap from offsets; an additional 15 percent can be credits from foreign markets if EPA-certified; and another 15 percent can be borrowed from future year caps; the term of loan is 5 years with 10 percent interest.[63]

The experience under the Clean Development Mechanism (CDM) illustrates how emissions trading programs can fail. According to Victor and Cullenward, about one-third of all CDM pipeline credits have been generated by controlling trifluoromethane or HFC-23, a byproduct from manufacturing.[64] In the industrialized nations, plants have installed devices to remove the emissions. However, in the developing countries, manufacturers have not installed the equipment in order to keep their emissions high and to position themselves to sell credits to EU sources looking for ways to offset their emissions. These companies are expected to make profits of more than $12 billion through 2012.[65] If the wealthy countries would have simply paid for these companies to install HFC-23 controls, the total cost would only have been $136 million.[66] Simply because a market mechanism is in place, there is no guarantee that it will operate efficiently.[67]

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59. REGIONAL GREENHOUSE GAS INITIATIVE MODEL RULE, *supra* note 52, at 63.
60. *Id.*
61. Kyoto Protocol, *supra* note 44, at Art. 3.
62. Zapfel, *supra* note 53.
63. America's Climate Security Act of 2007, S.B. 2191, 110th Cong. §§ 2301-2303 (2007), *available at* http://lieberman.senate.gov/documents/acsabill.pdf.
64. David G. Victor & Danny Cullenward, *Making Carbon Markets Work*, SCI. AM., Sept. 24, 2007, at 70, *available at* http://www.sciam.com/article.cfm?id=making-carbon-markets-wor.
65. *Id.*
66. *Id.*
67. *Id.*

Deciding Whether to Include a Safety Valve. A safety valve is a mechanism that ensures prices of allowances that sources buy to meet their obligations do not exceed a certain price. It has been a key issue in congressional debates as industry groups lobby for limits on the cost of the program. While it brings some certainty to compliance costs, safety valves threaten to violate the idea of an environmentally-determined emissions cap. They may represent a political compromise between the environmental protection goal and keeping a lid on compliance costs, but that comes at the price of reducing the efficiency of the market. RGGI deals with the issue by allowing offsets, as described above.[68] If prices are $\geq$ \$10/ton, sources can buy international offsets that are regulated under the Kyoto Protocol. The EU ETS does not include a safety valve.

Ensuring Accurate Monitoring, Compliance, and Enforcement. Effective enforcement that creates incentives for compliance is critical to the success of carbon trading. But there are conflicting imperatives to be balanced. Simple rules, minimal transaction costs, and other factors lead to maximizing the volume of trading and the consequential benefits, while effective compliance and enforcement places limits and costs on the process. Sanctions for noncompliance must be developed. Who should bear responsibility for non-fulfillment of conditions—the buyer? the seller? government? It may be possible to devise insurance schemes, funded by charges imposed on each transaction that can be used to purchase credits to meet shortfalls. The system could include extra credits to be used for such a purpose. Sanctions for failure to comply with conditions could include a prohibition on future trading and reduction of subsequent allowances by the number of credits in dispute. Generators of credits may be required to demonstrate that real reductions have been produced before trading can occur, as is the case in other commodity markets, where producers must show that the product is available and certify its quality. This requires strong political will to sanction parties that fail to meet their obligations.

Enforcement provisions in existing trading programs vary considerably. The RGGI, for example, is based on a three-year compliance period. Allowances can be banked for future use, but borrowing from future years' allowances is prohibited.[69] Under the EU ETS, sources must monitor and report annual emissions by March 31 for the previous year.[70] Emissions are based on calculations for different kinds of fuel.[71]

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68. *See supra* notes 59-60 and accompanying text.

69. Regional Greenhouse Gas Initiative, Public Review Model Review Draft, 3/23/06, sec. XX-6.6, *available at* http://www.rggi.org/docs/public_review_draft_mr.pdf.

70. Council Directive 2003/87/EC 2003 O.J. (L275 25.10.2003) of the European Parliament and of the Council, Oct. 13, 2003, establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (as amended by Council Directive 2004/1/EC 2004 O.J. (L338 18 13.11.2004)) art. 15.

71. *Id.* annex IV.

Self reporting is subject to third party verification.[72] Sources must surrender allowances by April 30 for the previous year.[73] The failure to surrender allowances results in a fine of 100 euros/allowance and the source must eventually surrender the allowance. [74] The name of non-compliant companies is published (the "name and shame" penalty).[75]

One of the biggest challenges to carbon trading is bringing developing countries into the regime. Given the volume of emissions from China, India, and others, this is absolutely essential. And including the developing countries in a regulatory program is a prerequisite for support from members of Congress and others for U.S. involvement in a global program. But these countries largely lack the kind of effective governmental regulatory infrastructure and capacity that is required for an effective program. It is hard to envision a global carbon trading program working until this key challenge is addressed. Otherwise, we run the risk of leakage—i.e., that emissions might be reduced in one area but simply increase in another.

IV. MAKING MARKETS WORK

Market forces largely drive the decisions about what goods and services are produced, how they are produced and used, and what their environmental consequences are. Making markets work better, by ensuring that prices include more of the true costs of producing and consuming goods and services, is essential in producing a more ecologically sustainable economic system. Because greenhouse gas emissions permeate the economy, climate policies must be able to reach and reshape virtually all sectors of the economy. A broadly based cap-and-trade program or a carbon tax can provide the basic structure for ensuring markets do a better job of taking into account the costs of carbon emissions. Generating support for such an expensive political intervention into markets, one that will raise prices significantly and will produce significant opposition, requires a clear understanding of the intersection of public policies and markets.

Markets are inescapably located in and constrained by the natural world. Natural resources are exhaustible and natural systems are, overall, irreplaceable. Capitalism is entirely dependent on the resources of the natural world and its ability to process wastes, and only economic activity that is consistent with ecological conditions and limits is ultimately sustainable. For some, their faith in markets gives no room for doubt about the viability of a world characterized by profound and growing inequality made acceptable by the promise of endless economic

72. *Id.* art. 16.
73. *Id.* art. 15.
74. *Id.* art. 16.
75. *Id.*

growth. Effective governance is required to rescue capitalism from unsustainable environmental and economic trends, but part of the problem with capitalist ideology is its commitment to weakening government, the very thing on which its future depends.

Discussions of politics and markets often focuses on the differences between political and market allocation of scarce resources. Politics is denigrated as irrational, plagued by political calculations, pressures, and incentives that are aimed at currying favor with powerful industries, insulating and protecting industries rather than forcing them to compete, and dominated by subsidies and pork barrel spending that are economically inefficient. Markets, in contrast, are paragons of virtue, designed to provoke innovation, reduce costs, and expand choices.

Characterizing politics and markets as polar opposites is an attractive strategy for those who wish to reduce political decision making and unleash private power, but it fundamentally misstates the nature of markets. Many markets fail to produce the benefits promised because they do not work well; their prices do not reflect the true costs of goods and services, because powerful interests that can externalize costs on third parties have a strong incentive to do so. Excluding some costs increases profits and expands market share, while imposing costs on other interests that are powerless to protect against them, or are so widely disseminated that there is little incentive to protest.

A more helpful approach looks at the intersection of politics and markets and their inviolability. Effective markets require strong and capable institutions to ensure that the benefits promised by markets are realized, and are not amid the relentless push to maximize profits. Markets require strong and effective governmental institutions to assign property rights, monitor emissions, and enforce requirements. Policy design and implementation are essential in ensuring that carbon markets produce the benefits they promise. If effective markets can be constructed and maintained, they can play a major role in reducing the threat of climate change. Well-functioning markets are clearly only part of the prescription. Regulations, subsidies, research, education, and other policies are also needed. And even if well functioning markets are established, additional policies will be required to deal with the distributional consequences of markets. Policies will need to address the impacts of climate change and help those who suffer its disruptions adapt. Well-functioning markets are part, but only part, of the broad set of actions humankind will likely need to pursue throughout the century as it finds ways to secure a healthy planet for all forms of life.

CONCLUSION

Carbon trading is only part of an efficient and effective response to reducing the threat of climate change. Investments in energy and materials efficiency, conservation, pollution prevention, renewable energy, and

more efficient resource use make sense for economic and environmental reasons apart from climate change. Because GHGs, once released, may stay in the atmosphere for a hundred years or longer, immediate, precautionary action is prudent as well as a long term risk reduction strategy. The longer we wait to reduce the threat of climate change, the larger the problem grows and the narrower our options become; the sooner we act, the more options we will have in the future. Carbon trading programs can produce valuable experience about how market-based systems can work to find the most cost-effective ways to reduce GHG emissions and help secure a stable climate.

CARBON MARKETS IN CONTEXT: INTO WHICH COMPONENT OF HOLDREN'S EQUATION DO THEY FIT?

ROBERT HARDAWAY†

INTRODUCTION

Carbon markets should be analyzed in the context of their potential as a practical and efficient means of reducing the ecological footprint of humans on the earth.[1]

An equation for measuring that ecological footprint was first developed in the 1970s in the course of a debate between Paul Ehrlich, Barry Commoner, and John Holdren.[2]

That equation[3] measures the human ecological footprint (I) as the multiple of total population (P), ecological impact per unit of consumption (U), and consumption per capita (C): I = PUC.

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1. *See* BARRY COMMONER, THE CLOSING CIRCLE: NATURE, MAN AND TECHNOLOGY 291 (Alfred A. Knopf ed., 1971); PAUL R. EHRLICH, THE POPULATION BOMB (19th prtg., 1970) (Paul R. Ehrlich is a Bing Professor of Population Studies in the Department of Biologic Sciences at Stanford University.); ROBERT M. HARDAWAY, POPULATION, LAW, AND THE ENVIRONMENT 17 (1994) (citing DANIEL D. CHIRAS, ENVIRONMENTAL SCIENCE: ACTION FOR A SUSTAINABLE FUTURE 5 (1991)); Paul R. Ehrlich, *Human Natures, Nature Conservation, and Environmental Ethics*, 52 BIOSCIENCE 1, Jan., 2002, (Magazine), at 31; Paul R. Ehrlich & John P. Holdren, *Impact of Population Growth*, 171 SCIENCE 3977, Mar. 26, 1971, (Magazine), at 1212-17; Paul R. Ehrlich & John P. Holdren, *Population and Panaceas: A Technological Perspective*, 19 BIOSCIENCE 12, Dec., 1967, (Magazine), at 1065; David Harrison, Jr., & Daniel Radov, *Clean Air: Law, Policy and Practice*, SN038 A.L.I.-A.B.A. 201 (2007) (discussing emissions trading for air quality and climate change in the United States and Europe); John P. Holdren, *Population and the Energy Problem*, 12 POPULATION & ENV'T 3, 231 (1991) (John P. Holdren is Professor of Environmental Science and Public Policy at Harvard University.); Frederick A.B. Meyerson, Commentary, *Population, Carbon Emissions, and Global Warming: The Forgotten Relationship at Kyoto*, 24 POPULATION & DEV. REV. 115, 115-30 (1998).

2. *See* Holdren, *Population and the Energy Problem*, *supra* note 1, at 242-49.

3. Holdren's original equation used the letter "A" to represent consumption per capita, and "T" to represent impact per unit of consumption, rendering I = PAT. *See id.* at 242-43; *see also* COMMONER, *supra* note 1; PAUL R. EHRLICH & ANNE H. EHRLICH, THE POPULATION EXPLOSION 58 (1990) (Anne Ehrlich is a Senior Research Associate in Biologic Sciences at Stanford University); INSTITUT NATION, CONSEQUENCES OF RAPID POPULATION GROWTH IN DEVELOPING COUNTRIES 161-90 (1991) (discussing Barry Commoner, *Rapid Population Growth and Environmental Stress*); Thomas Dietz & Eugene A. Rosa, *Effects of Population and Affluence on CO_2 Emissions*, 94 PROC. NAT'L ACAD. SCI. U.S.A. 1, 175 (1997) (Thomas Dietz is a Professor in the Department of Sociology and Anthropology at George Mason University; Eugene A. Rosa is a Professor in the Department of Sociology at Washington State University.); Paul R. Ehrlich & Anne H. Ehrlich, *The Population Explosion: Why We Should Care and What We Should Do About It*, 27 ENVTL. L. 1187, 1188 (1997).

I. THE "U" FACTOR

Environmental policy and spending to date has placed the greatest emphasis on the "U" component, spending billions globally to reduce the pollution generated by individual units of consumption. For example, catalytic converters have been mandated for cars in the U.S. and scrubbers mandated for factory or power industry smokestacks. That this emphasis may be have been misdirected was first recognized by former Environmental Protection Agency (EPA) director Lee Thomas, who observed that much of such environmental policy, to a significant degree, has merely transferred pollution in "one medium [such as the air] to another [such as soil or water] . . . . At best it is misleading—we think we are solving a problem and we aren't. At worst, it is perverse—it increases [rather than reduces] pollution."[4]

An example of the latter is the catalytic converter which, while reducing hydrocarbon emissions by a modest 12 percent, increased noxious oxide emissions by 28 percent.[5]

Hopes for an escape from this "circle game" have been generated by calls for use of "alternative energy sources" to reduce the pollution generated by each unit of production—thus the call for use of electric cars, bio-fuels, and solar or wind-generated power. Only recently have such agendas been called into question, as bio-fuels have been shown to require high levels of energy input in proportion to output (and thereby putting a strain on world food supplies);[6] electric cars have been shown to rely upon electricity produced either by carbon-emitting power plants, or worse, nuclear power;[7] solar farms have been attacked for ravaging the landscape[8] and windmills assailed as "Cuisinarts for birds"[9] and

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4. HARDAWAY, *supra* note 1, at 43.

5. *Id.* at 162.

6. *See* Jacqueline Lang Weaver, *The Traditional Petroleum Based Economy: An "Eventful" Future*, 36 CUMB. L. REV. 505, 578-79 (2005/2006) (Jacqueline Lang Weaver is an A.A. White Professor of Law at the University of Houston Law Center.); *see also* Paul R. Ehrlich, Anne H. Ehrlich, & Gretchen C. Daily, *Food Security, Population and Environment*, 19 POPULATION & DEV. REV. 1, 7-18 (1993); Mario Giampiertro, Sergio Ulgati, & David Pimentel, *Feasibility of Large-Scale Biofuel Production*, 47 BIOSCIENCE 9, Oct., 1997, (Magazine), at 587-96; John Manual, *Battle of the Biofuels*, 115 ENVTL. HEALTH PERSPECTIVES 2, A93-A95 (2007); David Tilman, Jason Hill, & Clarence Lehman, *Carbon-Negative Biofuels from Low-Input High-Diversity Grassland Biomass*, 314 SCIENCE 1598, Dec., 2006, (Magazine), at 1598-1600 (David Tilman, Jason Hill and Clarence Lehman are all Professors in the Department of Ecology, Evolution and Behavior at the University of Minnesota. Jason Hill is also a Professor in the Department of Applied Economics at the University of Minnesota).

7. *See* Taly L. Jolish, *Negotiating the Smog Away*, 18 VA. ENVTL. L.J. 305, 330 (1999); *see also* Lester B. Lave, Chris T. Hendrickson, & Francis Clay McMichael, *Environmental Implication of Electric Cars*, 268 SCIENCE 5213, May, 1995, (Magazine), at 993-95 (Lester B. Lave is a Higgins Professor of Economics and Industrial Administration; Chris Hendrickson is a Professor and Associate Dean of Engineering; and Francis McMichael is a Blenko Professor of Environmental Engineering at Carnegie Melon University).

8. Avi Brisman, *The Aesthetics of Wind Energy Systems*, 13 N.Y.U. ENVTL. L.J. 1, 6-8 (2005); *see also* PETER HARPER, *Why I Hate Wind Farms and Think There Should Be More of Them, in* ENERGY ALTERNATIVES 106, 107 (Helen Cothran ed., Greenhaven Press 2002); Stephen G. Bell,

worse than the ravages of strip mining, "Salvador Dali's worst nightmare";[10] geothermal schemes have been attacked as raising the risks of catastrophic earthquakes;[11] and clean water power produced by dams has been decried as threatening delicate and fragile ecosystems.[12]

A dramatic example of the latter was the case of *Tennessee Valley Authority v. Hill*,[13] in which the Supreme Court upheld the shutting down of the virtually completed Tellico Dam and Reservoir Project, which would have provided a clean energy alternative to coal-burning and nuclear plants and improved economic conditions for impoverished residents of the area surrounding the dam. Despite the fact that over 100 million dollars had already been expended on this attempt to find an "alternative energy source," the Court shut down the dam on grounds that the dam would have threatened one of 130 known species of "snail darter"[14]—this during a period of human history in which the unchecked expansion of the human race is causing the extinction of an entire living species every day and the extinction of one vertebrate species every nine months.[15]

While no one would discourage the continuing quest for alternative energy sources, it is becoming increasingly clear that the notion that any such source is ever going to permit the pollution-free but exponential expansion of the human race is largely illusory.

In any case, even if miraculous new technological developments were to permit a significant reduction in the pollution emitted by individual units of consumption, the exponential expansion of the number of units to accommodate an ever-expanding human race more than offsets

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Comment, *The Way the Winds are Blowing These Days: The Rapid Growth of Wind Energy and Legal Hurdles of North Carolina's General Statutes*, 8 N.C. J. L. & TECH. 117, 125 (2006).

9. Brisman, *supra* note 8, at 70; Morgan Winn Tingley, Effects of Offshore Wind Farms on Birds: Cuisinarts of the Sky or Just Tilting at Windmills? 54 (March 2003) (unpublished B.A. thesis, Harvard University); *see also* HARPER, *supra* note 8, at 107.

10. *See* Maria Goodavage, *Battling Safe Windmills: Bird Deaths in Turbines Spur Outcry*, USA TODAY, May 27, 1993, at 3A.

11. Darlene A. Cypser & Scott D. Davis, *Liability for Induced Earthquakes*, 9 J. ENVTL. L. & LITIG. 551, 557-58 (1994) (Cypser is a private practitioner in Boulder, CO; Davis is a geophysicist with the U.S. Geological Survey at the Center for Earthquake Research and Information.).

12. N. Leroy Poff, J. David Allan, Mark B. Bain, James R. Karr, Karen L. Prestegaard, Brian D. Richter, Richard E. Sparks & Julie C. Stromberg, *The Natural Flow Regime*, 47 BIOSCIENCE 769, 769 (1997) (Leroy Poff is an Assistant Professor in the Department of Biology at Colorado State University; David Allan is a Professor at the School of Natural Resources & Environment at the University of Michigan; Mark Bain is a Professor in the Department of Natural Resources at Cornell University; James Karr is a Professor in the Departments of Fisheries and Zoology at the University of Washington; Karen Prestegaard is an Associate Professor in the Department of Geology at the University of Maryland; Brian Richter is national hydrologist at the Nature Conservancy in Hayden, Colorado; Richard Sparks is the Director of the River Research Laboratories at the Illinois Natural History Survey; Julie Stromberg is an Associate Professor in the Department of Plant Biology at Arizona State University).

13. 437 U.S. 153, 172 (1978).

14. *Id.* at 171-72.

15. CHIRAS, *supra* note 1, at 5.

any reduction in pollution per unit. Thus, even if the pollutant emissions of automobiles could be reduced by 10 percent, the production of millions of additional automobiles to serve the needs of China and India alone would more than offset the reduction in emissions from individual automobiles far into the foreseeable future.[16]

In short, environmental efforts directed primarily toward reducing the pollution emitted by individual units must inexorably lead to the taking of one step forward and three steps backward in the quest for reducing mankind's ecological footprint on the earth.

II. THE "C" FACTOR

There is a growing political pop-trend toward placing significant environmental hopes on reducing the "C" component of Holdren's equation by urging or mandating the reduction of consumption per capita.[17]

In fact, however, the notion of reducing consumption per capita is not a new idea. Indeed it was tried—though involuntarily—in the 1930s all around the world. It was called the Great Depression, and most people did not like it.[18] The resurrection of this idea, first popularized by Al Gore in his book *Earth in the Balance*, comes at an unfortunate time when millions of people in the Third World and developing countries are striving to emerge from poverty and achieve a better life. Proponents of pursuing the "C" agenda are especially horrified at the prospect that millions of consumers in China and India may soon be driving cars and living a lifestyle previously enjoyed in the developed world. Indeed, when it was reported in early 2008 that an automobile manufacturer in India planned to produce a four passenger car listing for $2,500 that would make cars available to millions of people around the world who could not previously afford it, the New York Times ran an editorial decrying the environmental impact of so many former poor people driving cars.[19]

Other environmentalists pushing the "C" agenda attempt to avoid the perception of such cynical elitism by asserting that the burden of reducing consumption should fall primarily on the "rich" in the developed

16. *World Business Briefing Asia: India: Honda to Expand Car Output*, N.Y. TIMES, July 4, 2006, at C6 (noting that Honda plans to double its national output); Michelle Maynard & James Brooke, *Toyota Closes in on G.M.; Signs Point Toward Japanese Maker Being the Top Seller Soon*, N.Y. TIMES, December 21, 2005, at C1. GM plans to increase its production in China by 15-20 percent making China GM's second biggest market behind the United States. Brooke, *supra* note 16, at C2.

17. AL GORE, EARTH IN THE BALANCE: ECOLOGY AND THE HUMAN SPIRIT (1992); Michael P. Vandenberg & Anne C. Steinemann, *The Carbon Neutral Individual*, 82 N.Y.U. L. REV. 1673, 1702 (2007) (Michael Vandenberg is a Law Professor and Co-Director of the Regulatory Program at the Vanderbilt Center for the Study of Religion and Culture; Anne Steinemann is a Professor of Civil and Environmental engineering and Public Affairs at the University of Washington). Meyerson, *supra* note 1, at 115-30.

18. *See generally* MILTON FRIEDMAN & ANNA JACOBSON SCHWARTZ, A MONETARY HISTORY OF THE UNITED STATES, 1867-1960 299-419 (1963).

19. Editorial, *The Other Nano*, N.Y. TIMES, Jan. 16, 2008, at A22.

nations rather than on those hoping to emerge from poverty in the developing nations, apparently in the hopes that critics of such an agenda would not recognize that for every high consuming westerner there are thousands of poverty-stricken humans striving for a better life in the developing nations. Such cynicism was only exacerbated when Al Gore, taken to task for traveling by private jet and heating his palatial 10,000 square foot homes at the same time as he was urging lesser mortals to "cut their consumption," responded by claiming that he had "purchased" on the carbon market the right to pollute and spew excess carbon into the atmosphere.[20]

Perhaps most illustrative of this agenda is the goal set by the International Panel on Climate Change, which proposed a ceiling of 2.8 billion tons of carbon in the atmosphere.[21] Under this ceiling, each human on earth would be allotted an average of .53 tons of carbon a year, or about the same level as "Burkina Faso, the 13th poorest country in the world."[22]

In short, directing environmental policy toward the "C" factor is neither practical, nor humane. In the mid-1980s, Romanian dictator Ceausescu could simply order that the heat be cut off all across the country in the middle of winter in order to "reduce consumption."[23] But the notion that such mandatory reductions in consumption are practical in any society which values human dignity and respects the dreams of the teeming millions in the developing world for a better life is as illusory as the quest for environmental salvation in the "U" factor of Holdren's equation.

III. THE "P" FACTOR

The sole remaining factor in the Holdren equation is population. However, so seductive have been the political appeals of those whose agenda rests on emphasizing the "U" and "C" components of Holdren's equation, that very few of the "10,000 hopelessly decentralized (environmental) groups competing for funds"[24] even recognize the "P" factor

20. Press Release, Tennessee Center for Policy Research, Al Gore's Personal Energy Use Is His Own Inconvenient Truth: Gore's Home Uses More than 20 Times the National Average (Feb. 26, 2007), *available at* http://www.tennesseepolicy.org/main/article.php?article_id=367; CBSNews.com, *Gore Defends Mansion's Power Consumption*, Feb. 28, 2007, http://www.cbsnews.com/stories/2007/02/28/politics/main2522844.shtml; Peter Schweizer, *Gore Isn't Quite as Green as He's Led the World to Believe*, USA TODAY, Dec. 12, 2006, *available at* http://www.usatoday.com/news/opinion/editorials/2006-08-09-gore-green_x.htm.

21. *See* HARDAWAY, *supra* note 1, at 163.

22. *Id.* (citation omitted).

23. Avner Ben-Ner & J. Michael Montias, *The Introduction of Markets in a Hypercentralized Economy: The Case of Romania*, 5(4) J. OF ECON. PERSP. 163, 164-65 (1991) (Avner Ben-Ner is a Professor of Industrial Relation at the University of Minnesota; Michael Montias is a Professor of Economics at Yale University); Ronald H. Linden, *Socialist Patrimonialism and the Global Economy: The Case of Romania*, 40(2) INT'L ORG. 347, 352, 362, 366 (1986).

24. Robert M. Hardaway, *Environmental Malthusianism: Integrating Population and Environmental Policy*, 27 ENVTL. L. 1209, 1217 (1997) (citation omitted).

as fundamental to any realistic plan for reducing mankind's ecological footprint on the earth. Government too has neglected the "P" component, preferring to spend billions on the more politically acceptable, though largely futile, "C" and "U" agendas.

For both government and private environmental groups, the reason for avoiding the "P" agenda may be the same. Environmental groups find it far easier to raise funds by distributing lavish color brochures showing heart-rending pictures of bludgeoned baby seals than by raising sensitive population-related issues such as family planning, abortion, or illegal immigration. For many of these 10,000 environmental groups, ranging from the Xerces society, which promotes the preservation of snails and slugs, to the National Campaign to Stop Radiation Exposed Food, the top priority has become self-perpetuation of themselves as active entities. As environmentalist Tom Wolf has observed:

> The environmental organizations courted disaster when they "succeeded" American style. When they got too big, too rich and too remote from the environmental effects of their actions. Most of all when we abandoned moral appeal for fund-raising appeals, when we substituted holy war against the infidel for the sweet science of swaying souls. Like our competitors in organized religion, especially the televangelists, we enviros lost our credibility when we bought into the junk mail business. When the salvation we offered lost out to our insatiable need for money. Poverty, chastity and obedience wilted before the prospect of empire and power, "careers" in the institutionalized environmental movement.[25]

Meanwhile, every one third of a second (about the speed a machine gun flies its bullets) the planet makes room to accommodate one additional human being. To accommodate each additional human, 2,000 cubic meters of scarce fresh water must be drawn every year and 207 gigajoules of energy produced.[26] To accommodate these new humans, 100 acres of rainforest are destroyed every minute and one entire species sacrificed every day.[27] Each new human's waste products include his share of 270,000 metric tons of methane dumped annually into the world's oceans, and 30,000 metric tons of sulfur and 80,000 metric tons of carbon monoxide released into the atmosphere.[28] When he dies, his epitaph is written on a monument of waste and garbage 4,000 times his body weight.[29]

It has been estimated that simply making voluntary family planning programs available to every woman in the world would stabilize both the

25. Tom Wolf, *The Rise and Fall of the Environmental Movement*, L.A. TIMES, Mar. 24 1991, at M6 (ellipses indicating deletions are omitted).
26. HARDAWAY, *supra* note 1, at 17.
27. *Id.*
28. *Id.*
29. *Id.*

population and the ecological footprint of mankind[30]—without implementing mandatory controls of the kind implemented in China and India. However, cultural, religious, and legal obstacles worldwide continue to inhibit the implementation of such programs.[31]

In countries where religious or cultural concerns constrain making family planning programs available, governments decline to take on such challenges and instead take the course of least resistance by exporting the excess humans for whom they cannot provide—a course of action made possible only by the refusal of the human-importing countries such as the U.S. to enforce their own immigration laws.[32]

Despite evidence that countries that lack family planning services have the highest abortion rates,[33] while countries permitting abortion on demand but making family planning services available to all (such as Holland) have the lowest abortion rates,[34] many countries around the world persist in criminalizing abortion and denying family planning services to the poor. Even in the U.S., laws forbid granting funds to poor mothers to have abortions or to plan their families.[35]

Despite so much opportunity for moderating the ecological footprint of mankind on the earth by addressing the "P" factor in Holdren's equation, few environmental groups are willing to give up the junk mail business to take up the cause of family planning or illegal immigration. Even such high profile environmental groups as the Sierra Club continue to refuse to raise population-related issues in such areas as immigration.[36]

In 1992, a sign posted at William Clinton's election headquarters read, "It's the economy, stupid."[37]

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30. *Id.* at 165.

31. *See, e.g.*, JOHN A. ROBERTSON, CHILDREN OF CHOICE: FREEDOM AND THE NEW REPRODUCTIVE TECHNOLOGIES 24 (1994); Paula Abrams, *Population Control and Sustainability: It's the Same Old Song but with a Different Meaning*, 27 ENVTL. L. 1111, 1113 (1997); Albert P. Blaustein, *Arguendo: The Legal Challenge of Population Control*, 3 LAW & SOC'Y REV. 107, 109 (1968); Reed Boland, *The Environment, Population, and Women's Human Rights*, 27 ENVTL. L. 1137, 1157 (1997); Johnson C. Montgomery, *The Population Explosion and United States Law*, 22 HASTINGS L.J. 629, 629 (1971); Amartya Sen, *Fertility and Coercion*, 63 U. CHI. L. REV. 1035, 1041 (1996).

32. *See* Nicholos R. Montorio, Note, *The Issue of Mexican Immigration: Where Do We Go from Here,* 6 J. INT'L BUS. & L. 169, 186 (2007); Lou Dobbs, *Enforce the Immigration Laws We've Got*, CNN.com, Jul. 16, 2004, http://www.cnn.com/2004/US/07/16/broken.borders/index.html.

33. *See* HARDAWAY, *supra* note 1, at 110.

34. *Id.* (citation omitted).

35. *Id.* at 111 (citation omitted); *see also* Rust v. Sullivan, 500 U.S. 173 (1991).

36. SIERRA CLUB, SIERRA CLUB CONSERVATION POLICIES—POPULATION (Nov. 17, 2007), *available at* http://www.sierraclub.org/policy/conservation/population.pdf (containing no position on immigration levels or on policies governing immigration into the United States).

37. Gwen Ifill, *The 1992 Campaign: Political Memo; Clinton's 4-Point Plan to Win the First Debate*, N.Y. TIMES, Oct. 9, 1992, at A21.

It is now time for a sign to be posted in the halls of both government and the representatives of the environmental movement: "It's the population, stupid."

As a tool for reducing the carbon emissions of units of consumption, carbon markets fall clearly with the "U" factor of Holdren's equation, and as such run the risk of becoming mired in the self-defeating "circle game" about which former EPA director Lee Thomas expressed such concern.

Nevertheless, keeping in mind that even if carbon markets do nothing more than transfer carbon emissions from the air to the soil, they may nevertheless be of some value, even if for no other reason than by helping to clear the air, they may buy humankind time in dealing with global warming, which is largely a function of greenhouse gases.

But do carbon markets work? In analyzing that question, it is important to recognize that the challenge is to quantify the advantages and disadvantages of carbon markets so that current markets can be evaluated and a realistic, efficient, and fair plan devised for future implementation in countries where no such plans are currently implemented.

The two main "Cap and Trade Schemes"[38] currently implemented are the U.S. Acid Rain Market[39] and the European Emissions Trading Scheme (EU ETS).[40] Both of these schemes, typically described as "Cap

38. In a cap-and-trade program, "a State (or country) caps its total emission of a certain pollutant at some target amount." Nadia Zakir, *Emission Trading Initiatives: Responding to Climate Change through Market Forces*, ABA BUSINESS LAW TODAY, August 2007, *available at* http://www.abanet.org/buslaw/blt/2007-07-08/zakir.shtml. The cap defines the total number of emission allowances an emitting firm has the right to emit, each allowance correlates to a specific quantity of a pollutant. *Id.* The initial policy formulation will determine whether allowances are sold through an auction, directly, or indirectly. *See id.* Those emitting firms that are able to produce below their allowance level can sell their excess allowances to firms where it is uneconomical to reduce their carbon emission. *See id.* Therefore, carbon emissions are reduced through the placement of a market value on the right to pollute. *See id.*; *see also* STEPHEN BYGRAVE & MARTINA BOSI, LINKING PROJECT-BASED MECHANISMS WITH DOMESTIC GREENHOUSE GAS EMISSION TRADING SCHEMES 11 (2004); DALLAS BURTRAW, KAREN PALMER & DANNY KAHN, ALLOCATION OF CO_2 EMISSIONS ALLOWANCES IN THE REGIONAL GREENHOUSE GAS CAP-AND-TRADE PROGRAM 1 (2005); Harrison & Radov, *supra* note 1, at 264-66; ENVIRONMENTAL PROTECTION AGENCY, TOOLS OF THE TRADE: A GUIDE TO DESIGNING AND OPERATING A CAP-AND-TRADE PROGRAM FOR POLLUTION CONTROL 1 (2003).

39. Eric Shaffner, Comment, *Repudiation and Regret: Is the United States Sitting out the Kyoto Protocol to Its Economic Detriment?*, 37 ENVTL. L. 441, 454 (2007); Eric C. Bettelheim, Richard L. Sandor & Ian R. Swingland, *An Overview of a Free-Market Approach to Climate Change and Conservation*, 360 PHILOSOPHICAL TRANSACTIONS: MATHEMATICAL, PHYSICAL, AND ENGINEERING SCIENCE 1607, 1612 (2002) ("Direct monitoring of emissions is used by to verify that the cap is achieved and to insure the value of tradable allowances.").

40. The EU ETS was established as a cost effective mechanism to comply with the commitment made by the European Union to the Kyoto Protocol. *See* Council Directive 2003/87/EC, art. 1, 2003 O.J. (L 275) 32. The program is designed to regulate 46 percent of the EU's CO_2 emissions. Justin Guest, *Project Based Mechanisms & the European Emissions Trading System*, COMMODITIES NOW, September 2003, at 1, *available at* http://www.commodities-now.com/content/market-areas/general/ma-article-5.pdf?PHPSESSID=34967b. The directors established an allowance allocation policy that was consistent with the Member State's obligation under the EU Burden Sharing Agreement. *See* Council Directive 2003/87, art. 11, 2003 O.J. (L 275) 36 (EC). Within the first two

and Trade" schemes, are based on governmental establishment of emissions targets, which may be met by covered industries either through actual compliance with those targets or by purchase of the rights to exceed emission targets from other industries whose emissions are below the established emissions targets.[41]

Voluntary cap and trade programs currently implemented include the Chicago Climate Exchange Program and the Kyoto Protocol Clean Development Mechanism. Pending mandatory programs are the Regional Greenhouse Gas Initiative, the California Global Warming Solutions Act, and the Climate Stewardship Act of 2007.

The purported advantages and disadvantages of each of these markets are currently undergoing considerable debate. Advocates of these programs cite the provision of economic incentives for industries to innovate in finding technological means of reducing carbon emissions and thereby serving the ultimate goal of reducing world carbon production.[42] Critics cite the economic burden on industry and the inevitable economic burden placed on consumers, as well as instability caused by volatile carbon markets, including misallocated investment incentives triggered by uncertainties in the future costs of carbon emission rights.[43]

Accordingly, a sub-debate has focused on the relative economic merits of a carbon market and a direct carbon excise regimen imposed on industry, since both would presumably provide incentives for innovation in carbon reducing technologies and both would result in a reduction of global emissions of greenhouse gases.

Eric Toder, of the Urban Institute and Urban-Brookings Tax Policy Center, has recently released several studies analyzing the distributional effects of a carbon tax, and compared those effects with those of cap and trade programs, and found that since "any quantity restriction (cap and trade) implies a change in the market prices because the permits are scarce," it follows that a "tax equal to the permit price would generate

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phases, allowances are distributed on the basis of grandfathering or using industry benchmarks. Harrison & Radov, *supra* note 1. The allowances are then bought, sold, and traded in a carbon market. *See, e.g.*, Council Directive 2003/87, art. 12, 2003 O.J. (L 275) 36 (EC); EU ACTION AGAINST CLIMATE CHANGE, EU EMISSIONS TRADING: AN OPEN SYSTEM PROMOTING GLOBAL INNOVATION 9 (2007), *available at* http://ec.europa.eu/environment/climat/pdf/bali/eu_action.pdf.

41. *See, e.g.*, EU ACTION AGAINST CLIMATE CHANGE 3, 9 (2007), *available at* http://ec.europa.eu/environment/climat/pdf/bali/eu_action.pdf; U.S. EPA, CAP AND TRADE: ACID RAIN PROGRAM BASICS 1-2, http://www.epa.gov/airmarkt/cap-trade/docs/arbasics.pdf (last visited Mar. 22, 2008).

42. *E.g.*, Environmental Defense Fund, *The Cap and Trade Success Story*, Feb. 12, 2007, http://www.edf.org/page.cfm?tagID=1085.

43. *See* ARTHUR LAFFER & WAYNE WINEGARDEN, THE ADVERSE ECONOMIC IMPACTS OF CAP-AND-TRADE REGULATIONS 2, 4-5, 7, 13-14, 16 (2007), *available at* http://www.arduinlaffermoore.com/PDF/Cap_and_Trade_Economic_Analysis_September_2007.pdf.

the same reduction in consumption."[44] He therefore concludes that "cap and trade proposals affect consumers the same way as a carbon excise tax that is equal to the market-determined permit price."[45]

In other words, the same carbon-reducing effects can be achieved through either cap and trade or carbon excise taxes, depending only upon the target caps set in cap and trade and the amount of tax set under an excise protocol.

What is clear from such studies, however, is that both carbon markets and carbon excise taxes have the potential of imposing enormous economic costs on society depending on the target levels of carbon emissions set under cap and trade or the amount of the tax set under a carbon excise tax program. If the levels are set low or the taxes high, the reduction in carbon emissions is likely to be greater, but the effects on an economy more severe. If the levels are set high and the taxes low, the effects on the economy will be less severe, but the effect on carbon reduction relatively minimal. In the end, political considerations will determine the amount of amount of tax or emissions levels, just as they determine the imposition of any other tax.

In either case, the question must be asked whether society's resources are best spent on the "U" component of Holdren's equation, particularly when such expenditures in the past have been shown to have such a relatively insignificant impact on mankind's ecological footprint on the earth. For all the billions spent on this component, carbon production today is greater than at any time in the history of the earth. The notion that we can save the earth by taking one step forward (by modest linear reductions in carbon emissions of individual units of consumption), while at the same time taking three steps backward (by increasing exponentially the number of individual units) is akin to rearranging the deck chairs on the Titanic.

Although the Titanic analogy has become much overused, it is particularly descriptive of current environmental policy. Governments are busy transferring toxic wastes from the first class to third class compartments, or shuffling carbon from the air to the engine room. Demagogic ship officers are engaged in encouraging passengers not to use so many chairs, or advocating that more people be squeezed on to each chair, while others busy themselves in producing more chairs. Still others scurry about trying to find the dwindling supply of chairs per person. Meanwhile the entire ship is sinking under the weight of an exponentially expanding population.

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44. Dr. Eric Toder, Urban Institute and Urban-Brookings Tax Policy Center, Address at the *Denver University Law Review* Symposium: Who Should Pay for Reducing Global Warming? 1 (Feb. 15, 2008) (transcript on file with author).

45. *Id.* at 5.

CONCLUSION

For every dollar governments expend on the "U" component, only pennies are spent on the "P" component, the subcomponents of which are family-planning programs, government funding of abortions, tax reform that encourages family planning rather than rewards and subsidizes large families, and enforcement of immigration laws that would encourage human-exporting countries to deal with population pressures within their countries by addressing the rights of women, as well as lowering the cultural, legal, and economic barriers to family planning, rather than by taking the course of least resistance of exporting their excess humans to developed countries.

If any real progress is to be made in protecting the global environment for our children and grandchildren, these priorities must be reversed.

THE EUROPEAN UNION'S MULTINATIONAL CARBON TRADING PROGRAM

VED P. NANDA†

INTRODUCTION

This article will primarily discuss the European Union's Greenhouse Gas Emissions Trading Scheme (EU ETS), which it launched in January 2005 as a market-based solution to provide incentives for curbing greenhouse gas (GHG) emissions.[1] Although this was the first comprehensive multinational greenhouse gas emissions trading program covering installations in each of the EU's then 25 member states, the United States fifteen years earlier had initiated an innovative national sulfur dioxide (SO_2) emissions trading program under Title IV of the Clean Air Act amendments of 1990.[2] That program was aimed at reducing sulfur emissions and the resulting acid rain, which "represents a threat to natural resources, ecosystems, materials, visibility, and public health."[3] Under Title IV, the acid decomposition control program requires significant reductions in sulfur dioxide emissions from 1980 levels.

Subsequently, the 1997 Kyoto Protocol,[4] which was negotiated under the 1992 United Nations Framework Convention on Climate Change,[5] established emissions reductions commitments for industrialized states to an average 5.2 percent reduction below the benchmark 1990 concentration levels by the 2008-2012 period. The Kyoto Protocol includes international emissions trading among other "flexibility mechanisms" to help countries meet their commitments to effectuate green-

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1. Council Directive 2003/87/EC 2003 O.J. (L275 25.10.2003) of the European Parliament and of the Council, Oct. 13, 2003, establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (as amended by Council Directive 2004/1/EC 2004 O.J. (L338 18 13.11.2004)) [hereinafter Directive 2003/87/EC].

2. 42 U.S.C.A. § 7651 (2008). *See generally* Revisions to the Permits and Sulfur Dioxide Allowance System Regulations Under Title IV of the Clean Air Act, *available at* http://www.epa.gov/EPA-AIR/1998/August/Day-03/a20605.htm.

3. § 7651(a) (U.S. Congressional finding).

4. Kyoto Protocol to the United Nations Framework Convention on Climate Change (Dec. 10, 1997), U.N. Doc. FCCC/CP/197/7/Add.2 (final version), *entered into force* Feb. 6, 2005, *reprinted in* 37 I.L.M. 22 (1998) [hereinafter Kyoto Protocol], *available at* http://unfccc.int/resource/docs/convkp/kpeng.pdf. *See generally* MICHAEL GRUB ET AL., THE KYOTO PROTOCOL, A GUIDE AND ASSESSMENT (1999).

5. United Nations Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107, *reprinted in* 31 I.L.M. 848 (1992), *entered into force* March 21, 1994 [hereinafter UNFCCC].

house gas reductions. The EU ETS is designed for EU member states to comply collectively with their commitments to reduce emissions under the Kyoto Protocol. Thus, while the EU commitment is to be observed collectively, the targets may vary for member states.

The U.S. Acid Rain Program (ARP) is a model that has been followed by several countries,[6] as well as the Kyoto Protocol itself and the EU. Thus it seems appropriate to briefly review the U.S. and Kyoto experiments on emissions trading before discussing the EU program.

I. U.S. AND KYOTO EMISSIONS TRADING

The Clean Air amendments of 1990 established an overall national limit on sulfur dioxide emissions and an allowance trading program[7] to regulate SO_2 from power plants. The sulfur trading program was divided into two phases—Phase I began in 1995 and Phase II in 2000. The nationwide ceiling on emissions by electric utilities was set at 8.90 million tons and the Environmental Protection Agency (EPA) was authorized to allocate annual emissions to firms in tons per year.[8]

Compliance can be achieved through an emissions allocation and transfer system. The cap-and-trade program also extends to effectuate reductions in nitrogen-oxide emissions. Both of these programs have emissions monitoring rules that are stringent and impose severe penalties that are automatically assessed if there are not enough allowances to cover a source's emissions at the end of the year. Starting in 2000, the program covers virtually all steam-electric utility units in the U.S.

The ARP has been considered a great success. In its 2005 Progress Report on the ARP, the EPA stated:

> After 11 years of implementation, monitoring, and assessment, the ARP has proved to be an effective and efficient means of meeting emission reduction goals under the Clean Air Act. A 2005 study estimated the program's benefits at $122 billion annually in 2010, while cost estimates are around $3 billion annually (in 2000).[9]

Commentators Joseph A. Kruger and William A. Pizer concluded in 2004:

> The U.S. SO_2 program is widely acclaimed as a success. It has resulted in early emissions reductions (spurred by the program's bank-

6. *See, e.g.*, A. Denny Ellerman & Barbara K. Buchner, *The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results*, 1 REV. ENVTL. ECON. & POL'Y 66, 68 (2007) ("Emissions trading programs in the United States were closely followed by many in Europe . . . .") (referring to the UK, Danish, and Dutch systems).

7. § 7651b.

8. *Id.* § 7651b(a)(1).

9. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ACID RAIN PROGRAM 2005 PROGRESS REPORT, *available at* www.epa.gov/airmarkt/progress/docs/2005report.pdf.

> ing provision), a sharp drop in acid deposition throughout the eastern United States, and lower-than-expected costs. The structure of the program has been influential in the design of the Kyoto framework and the European Emissions Trading System . . . .[10]

The Kyoto Protocol established binding reduction targets and timetables for Industrialized (Annex I) Parties, mandating that they reduce emissions by a varying percentage below 1990 levels.[11] It also provided for measurement, reporting, and review of information,[12] which is an important starting point for building a compliance regime through later amendment. Reduction targets were set for GHGs over a five-year initial commitment period between 2008 and 2012, to be followed by subsequent commitment periods.[13] The European Union was initially opposed to emissions trading, which was strongly advocated by the United States as a means of meeting the Kyoto commitments during the negotiation phase. However, the parties compromised, and hence the Protocol included several market-based flexibility mechanisms to achieve compliance in a cost-effective manner. These mechanisms are international emissions trading, joint implementation, and the Clean Development Mechanism.[14]

At the United States' insistence, and notwithstanding opposition from the EU, the Protocol ultimately included the free market trading of emissions.[15] The "target-based" emissions trading allows Annex I developed countries to purchase emissions credits from other Annex I parties that reduce their GHGs more than required.[16] Thus, states that emit less than their quota of GHGs are able to sell their emissions credits to polluting states that need them to meet their commitments.

The United States was also successful in furthering its "market-based flexibility" approach, as the Protocol provides for Joint Implementation (JI), under which a country with an emission reduction commitment under the Kyoto Protocol is able to acquire credits for projects reducing GHG emissions or enhancing sinks in any other country with a commitment.[17] JI projects earn Emission Reduction Units (ERUs), each equivalent to one metric ton of CO_2.[18] Developed countries can thus

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10. Joseph A. Kruger & William A. Pizer, *Greenhouse Gas Trading in Europe, The New Grand Policy Experiment*, ENVIRONMENT, Oct. 1, 2004, at 8, 14, *available at* http://www.encyclopedia.com/doc/1G1-123629147.html.

11. Kyoto Protocol, *supra* note 4, art. 3, ¶ 1.

12. *See id.* art. 3, ¶ 3.

13. *Id.* art. 3, ¶ 1.

14. *See id.* art. 6, art. 12, art. 17.

15. *Id.* art. 17.

16. *See* Citizens for Global Solutions, Climate Change and the Kyoto Protocol, http://www.globalsolutions.org/issues/climate_change_and_kyoto_protocol (last visited Mar. 17, 2008).

17. *See* Kyoto Protocol, *supra* note 4, art. 6.

18. UNITED NATIONS ENVIRONMENT PROGRAMME, UNEP YEAR BOOK 2008: AN OVERVIEW OF OUR CHANGING ENVIRONMENT 26, *available at* http://www.unep.org/geo/yearbook/yb2008/.

trade among themselves, provided they meet several conditions. One such condition is that the trade must produce reductions in addition to any that would have otherwise occurred.[19] Also, the parties are able to obtain credits through trading only if they are also taking measures to reduce emissions domestically.[20]

JI was directed especially at countries with economies in transition. A supervisory committee under the direction of the states party to the Protocol oversees the JI mechanism.[21] Since it is only in 2008 that the first ERUs will be issued for a crediting period,[22] no project evaluation is yet possible.

During the negotiations, the EU had argued that its member nations should be able to share their emissions limit collectively, so long as the overall EU reductions were met. In response, the United States was able to persuade the negotiating parties to include a provision which allows any group of countries to fulfill their target-based commitments jointly.[23] Thus, a regional emissions trading or multinational "bubble" is permitted.

Another free market mechanism successfully advocated by the United States and also by developing countries is the Clean Development Mechanism (CDM), which is designed to effectuate reductions in carbon emissions while allowing Annex I developed countries to engage in JI-type project-based credits either by governments of or private parties in Annex I countries.[24] Thus, Annex I countries may earn credits by assisting developing countries as they reduce their emissions. Emission-reducing projects in developing countries can earn CERs that can be sold to buyers in industrialized countries.

The credits that can be earned and traded are called Certified Emissions Reductions (CERs), and are measured in metric tons of CO_2 equivalent.[25] Thus, the purpose of the CDM is to assist developing countries in achieving sustainable development while allowing Annex I countries flexibility in meeting their emissions reduction targets under the Protocol. Similar to JI, CDM requires emissions reductions to be supplemental to those that would have otherwise occurred without the project. CDM projects include several energy efficiency projects and those

19. *Id.*
20. *Id.*
21. *See* Guidance on the Implementation of Article 6 of the Kyoto Protocol, *available at* http://unfccc.int/files/meetings/cop_13/application/pdf/cmp_art_six_kp.pdf (last visited Mar. 17, 2008).
22. *See* UNFCCC, *Joint Implementation*, *available at* http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php (last visited Mar. 17, 2008).
23. Kyoto Protocol, *supra* note 4, art. 4.
24. *Id.* art. 12.
25. *Id.*

that reduce non-CEO industrial greenhouse gases, as well as aforestation and reforestation projects.[26]

While the CDM program was launched in November 2001, the first project was registered about three years after that, and the first CERs were issued in October 2005.[27] An Executive Board under the direction of the states party to the Protocol oversees the CDM.[28] The United Nations Environment Programme (UNEP) reports that 852 projects had been registered in 49 countries as of the end of November 2007 and 2600 projects are currently in the global pipeline; the number of expected CERs will be more than $2.5 billion by the end of 2012, while as of October 2007, $85.9 million of CERs have been issued by the CDM Executive Board.[29]

II. THE EU TRADING SCHEME

As to the EU developments, with its 27 member states, trading in carbon emissions, under which allowances and credits are bought and sold, has become a prominent part of the EU's response to the challenge of climate change. The aim of the EU emission trading scheme is to help EU member states to achieve compliance with their commitments under the Kyoto Protocol. As the European Community had ratified the Kyoto Protocol jointly with its member states, the EU is obligated to reduce its GHG emissions by eight percent over the 2008-2012 period, compared to its 1990 emissions.[30]

The EU scheme works on a cap-and-trade basis and is designed to result in both economic and environmental gains. And it could become a credible and central tool for future climate mitigation following the European Union's "Green Agenda," which was unveiled on January 23, 2008, in Brussels under the flashy title, "20 20 by 2020—Europe's Climate Change Opportunity."[31] This gives the EU the high moral ground and also is likely to turn carbon emissions into a mainstream commodity.

The EU's initiative on climate change and renewable energy for 2020 began with the European Commission's proposals "calling for a quantum leap in the EU's commitment to change."[32] The European Par-

26. UNITED NATIONS ENVIRONMENT PROGRAMME, *supra* note 18, at 25.
27. *Id.*
28. *Id.*
29. *Id.*
30. Directive 2003/87/EC, *supra* note 1, at 1.
31. *See* Commission of the European Communities, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 20 20 by 2020—Europe's Climate Change Opportunity*, COM (2008) 30 final (Jan. 23, 2008) [hereinafter *20 20 by 2020*].
32. Commission of the European Communities, *Commission Staff Working Document, Impact Assessment*, SEC (2008) 85/3, at 2 (Jan. 23, 2008) [hereinafter *Impact Assessment*].

liament[33] was in support of taking definitive steps to curb greenhouse gas emissions and developing renewable energy sources in addressing climate change. In March 2007 the European Council agreed to set precise, legally binding targets establishing two key targets: 1) a reduction of 20 percent in GHGs by 2020 and to increase it to 30 percent if under an international agreement other developed countries commit to "comparable emission reductions and economically more advanced countries to contributing adequately according to their responsibilities and respective capabilities";[34] and 2) a 20 percent share of renewable energies in EU energy consumption by 2020.[35] The Council had called upon the European Commission in February "to bring forward proposals which create the right incentives for forward-looking low-carbon investment decisions."[36]

The European Council's invitation to the European Commission to present concrete proposals for implementing a new approach to the EU energy and climate change issues reflected an acknowledgement of and a response to the evolving and growing public opinion in Europe that a new European approach to energy and climate policy was needed. Hence, there was a political consensus for the change. As the European Commission noted:

> The resolve of the European Council was a signal to our international partners that the EU was ready to turn words into deeds. This paid dividends at the United Nations Climate Change Conference in Bali in December 2007. The European Union was able to play a pivotal role in securing agreement on the roadmap towards a new comprehensive agreement on cutting emissions to be reached by 2009. This reinforced the EU's determination to press on with its commitment to fighting climate change, to show that it was ready to give force to its conviction that developed countries can and should commit to a 30 % cut in emission levels by 2020. The EU should continue to take the lead in the negotiation of an ambitious international agreement.[37]

The Commission responded to the Council's call by presenting three policy proposals: 1) a proposal for a Directive on the promotion of renewable energy; 2) a proposal for amending the EU Emissions Trading

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33. *See* European Parliament Resolution on Climate Change, EUR. PARL. DOC. P6_TA 0038 (2007).

34. *20 20 by 2020*, *supra* note 31, at 2.

35. *Id.*

36. *Council Conclusion of 20 February 2007, EU Objectives for the Further Development of the International Climate Regime Beyond 2012*, *available at* http://register.consilium.europa.eu/pdf/en/07/st06/st06621.en07.pdf, *cited in Commission of the European Communities Proposal for a Directive of the European Parliament and of the Council Amending Directive 2003/87/EC so as to Improve and Extend the Greenhouse Gas Emission Allowance Trading System of the Community*, COM (2008) 16 final 2008/0013 (COD), at 3 (Jan. 23, 2008), *available at* http://www.aem.cz/svse/data/080123_eu_ets_draft_proposal.pdf [hereinafter *Commission Proposal for a New Directive*].

37. *20 20 by 2020*, *supra* note 31, at 3.

Directive reviewing the EU ETS; and 3) a proposal on sharing the member states' efforts to meet the EU GHG reduction commitment in sectors not covered by the EU ETS, such as transport, buildings, services, agriculture, small industrial installations, and waste.[38] The discussion here will be limited to the Commission proposal relating to amendment of the EU Emissions Trading Directive.

The Commission based its proposals on five key principles: 1) the targets must be met and thus the proposals must be sufficiently strong and effective to be credible, accompanied by mechanisms for monitoring and compliance; 2) the effort required from member states must be fair; 3) the cost must be minimized; 4) the EU must continue its efforts beyond 2020 to meet the target of curbing global emissions by 50 percent by 2050; and 5) the EU must actively promote a comprehensive international agreement to cut GHG emissions.[39]

The EU ETS program is to run in two phases, from 2005 through 2007 in the first phase, and in the second phase from 2008 through 2012, which coincides with the five-year period of Kyoto commitment. The 2003 Council Directive,[40] under which EU ETS became operative, established a regulatory framework for the implementation of a mandatory GHG allowance trading scheme in its member states so as to promote reduction of GHG emissions in an economically efficient and cost-effective manner.

To summarize selected major provisions of the Directive, operators of installations listed under Annex I must hold a permit from a competent authority authorizing GHG emissions.[41] Such operators are under monitoring and reporting requirements for their GHG emissions.[42] These operators must surrender allowances equal to the verified emissions of the total emissions of the installation in each calendar year of the EU ETS.[43] Each member state is required to develop a National Allocation Plan (NAP) stating the total quantity of allowances that it intends to allocate to installations subject to approval by the Commission.[44] These allowances can be transferred between any persons in the Community.[45] Member states are required to make decisions regarding their NAP that are consistent with their obligations under the EU and under the Kyoto Protocol.[46] Member states are required to distribute, free of charge, at

38. *Impact Assessment*, *supra* note 32, at 2.
39. *20 20 by 2020*, *supra* note 31, at 4-5.
40. Directive 2003/87/EC, *supra* note 1.
41. *Id.* art. 4.
42. *Id.* art. 6.2(c), (d).
43. *Id.* art. 6.2(e).
44. *Id.* art. 9.
45. *Id.* art. 12.1(a).
46. *Id.* art. 9, Annex III.

least 95 percent of allowances in Phase I and at least 90 percent of allowances in Phase II.[47]

Thus, under EU ETS, operators are required to surrender allowances to cover their actual GHG emissions during the previous calendar year.[48] However, operators can trade the emission allowances they have been allocated.[49] Companies can sell allowances if they cut their own emissions and they can buy them if they find themselves with insufficient allowances to cover their emissions. Thus, a reduction by companies of their emissions results in their earning an income stream from the sale of allowances. This, it is hoped, will stimulate innovation and push change where it is most cost-effective. However, if operators find cutting emissions more expensive than buying extra allowances, they will have to purchase them. Each allowance gives operators the right to emit one ton of CO_2 equivalent during a specified period. Up to five percent of allowances may be auctioned in the first phase of the program and up to ten percent in the second phase.[50] National governments allocate allowances to companies under this "cap-and-trade" system and the Commission approves the national plans.[51]

Initially, in the first phase of trading period, from 2005 to 2007, only CO_2 emissions are covered, and those also from large emitters in the power and heat generation industry and in selected energy-intensive industrial sectors, such as combustion plants, oil refineries, coke ovens, iron and steel plants, and factories making cement, glass, lime, bricks, ceramic, pulp, and paper.[52] Nearly 10,500 installations in the 27 member states of the EU, accounting for around 50 percent of the EU's CO_2 emissions and about 40 percent of its overall GHG emissions are covered.[53] During the second phase, from 2008 through 2012, nitrous oxide emissions are also being included.[54]

The EU ETS is linked with the Kyoto Protocol's flexibility mechanisms—the CDM and JI—which are project-based. Thus, European industry can use credits from the CDM and JI to help them comply with their obligations under the system. By allowing this linkage, the EU provides tangible support to developing countries in their efforts to achieve sustainable development. Also, banking and borrowing are per-

47. *Id.* art. 10.
48. *Id.*
49. *Id.*
50. *Id.*
51. *Id.* art. 24.
52. EUROPEAN COMMISSION, EU ACTION AGAINST CLIMATE CHANGE—EU EMISSIONS TRADING: AN OPEN SYSTEM PROMOTING GLOBAL INNOVATION 7 (2007). The facts and figures in this pertaining to the EU ETS regulatory scheme are derived from European Commission publications.
53. *Id.*
54. *See* Directive 2003/87/EC, *supra* note 1, Annex II.

missible. During the first phase, the necessary infrastructure for monitoring, reporting, and verification, including registries, was established.

After reviewing the ETS, the European Commission noted that the ETS

> needs to be strengthened and updated if it is to meet its new objectives. The incentive effect of the current ETS has been cushioned by the generous number of allowances handed out in the first phase (2005-2007). The structure of the ETS, with national allocation plans, has raised the risk of distortions in terms of competition and the internal market. The scope of the ETS, in terms of the sectors of the economy covered and the gases included, has also limited its ability to drive emission cuts.[55]

The Commission stated that its proposed amendments[56] to the EU ETS Directive are guided by three overall objectives:

> 1. Fully exploiting the potential of the EU ETS to contribute to the EU's overall greenhouse gas reduction commitments in an economically efficient manner.
>
> 2. Refining and improving the EU ETS in the light of experience gathered.
>
> 3. Contributing to transforming Europe into a low greenhouse-gas-emitting economy and creating the right incentives for forward looking low carbon investment decisions by reinforcing a clear, undistorted and long-term carbon price signal.[57]

As to the scope of the ETS, the Commission proposed to expand its coverage with the inclusion of greenhouse gases other than CO_2 and all major industrial emitters.[58] In light of its conclusion that "[t]he emissions trading system should only be extended to emissions which are capable of being monitored, reported and verified with the same level of accuracy as applies under the monitoring, reporting and verification requirements currently applicable under the Directive,"[59] the Commission did not include shipping. Industrial plants emitting less than 10,000 tons of CO_2 would not have to participate in the ETS,[60] provided alternative measures were in place to ensure that they adequately contribute to reduction efforts.

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55. *20 20 by 2020, supra* note 31, at 5.
56. For the text of the revised Directive, see *Commission Proposal for a New Directive, supra* note 36, at 12.
57. *Id.* at 3.
58. *Id.* at 5.
59. *Id.* at 4.
60. *Id.* at 5.

The Commission proposed to replace the national allocation plans by a harmonized ETS covering the whole Union having common rules. Noting that "in the absence of comparable constraints for industry in third countries, there may arise a risk of 'carbon leakage', i.e. relocation of greenhouse gas emitting activities from the EU to third countries and thereby increasing global emissions,"[61] the Commission proposed that the power sector would be subject to full auctioning from the start of 2013.[62] Most other industrial sectors, including aviation, would be subject to full auctioning gradually and they are to reach full auctioning by 2020.[63] Member states are to handle auctioning and their treasuries would benefit by the auctioning revenues.[64]

Noting the need for linking with other emission trading systems to build a global carbon market, but stressing harmonization, the Commission proposed that under the new ETS,

> companies will still have access to CDMs, but the use of credits generated by such mechanisms will be limited to the levels used in the current ETS period. This would leave room for access to this mechanism to be increased once an international agreement is signed—central to allowing the EU to step up swiftly to the more challenging 30% GHG reduction in the event of an international agreement. Freeing up access to this mechanism would also be an incentive for third countries to sign up to an international agreement, in the knowledge that European investment technology could flow as a result.[65]

The Commission had taken this step after noting that, while CDMs had proved useful in cutting emissions, there was "a risk that too generous a use of CDMs can dilute the effectiveness of the ETS by increasing the supply of credits and thereby cutting demand for allowances, and reducing the incentive for governments and companies to promote emission reductions at home."[66]

The Commission also acknowledged that since the revised ETS is to cover less than half of the GHG emissions, the remaining emissions, such as buildings, transport, agriculture, waste, and industrial plants falling under the threshold for inclusion in the ETS, must be covered through national commitments under an EU framework.[67] It set the target of a 10 percent reduction in emissions from 2005 levels in these sec-

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61. *Id.* at 8.
62. *Id.* at 15.
63. *Id.* at 9.
64. *Id.* at 7-9.
65. *20 20 by 2020*, *supra* note 31, at 6-7; *see also Commission Proposal for a New Directive*, *supra* note 36, at 10-11.
66. *20 20 by 2020*, *supra* note 31, at 6.
67. *Id.* at 7.

tors.[68] Although EU measures such as tougher standards on CO_2 emissions from cars and fuel would be applicable, member states are to determine the measures to be taken and sectors where they would like to concentrate their efforts.[69]

Thus the EU's new agenda, which must be endorsed by the European Parliament and by member states to become effective, extends the scope of the ETS with the inclusion of greenhouse gases other than CO_2 and all other major industrial emitters. Allocations are to be reduced year by year so as to allow for emissions covered by the ETS to be reduced by 21 percent from 2005 levels by 2020.[70] Full auctioning is aimed at making older, dirty ways of power generation, such as coal burning, so expensive that they are prohibitive. This could encourage new investments across the European power sector in new and cleaner technologies, such as wind, carbon capture, and carbon sequestration. Until now allowances were given away, which was a major shortcoming in the first phase. In the sectors not involved in the carbon trading scheme, such as transport, farming, and construction, national caps are to be imposed.

Under the new agenda, the EU threatens to limit severely the trade in certified emission reduction credits after 2012 if there is no comprehensive global successor treaty to the Kyoto Protocol. If no new CERs are admitted into Europe after 2012, the UN-approved carbon reduction projects will be severely affected, for under the new ETS companies will still have access to the Clean Development Mechanism, but the use of credits generated by this mechanism will be limited to the levels used in the current ETS period. Access to this mechanism will only be increased after an international agreement is reached.

Jose Manuel Barroso, the President of the European Commission, announcing reforms to the ETS in its third phase after 2012, said that "Europe would not allow other countries to exploit its virtuous stance on carbon."[71] Without an international agreement, which is the best way to tackle the problem, he added, "There is no point in Europe being tough if it just means production shifting to countries allowing a free-for-all on emissions."[72]

The EU's tough measures would include forcing importers to buy carbon permits on the ETS and restrictions on the import of additional CER credits after 2012 unless "a satisfactory international agreement is

68. *Id.*
69. *Id.*
70. *Id.* at 6.
71. Carl Mortished, *European Move to Tighten Carbon Trade Permits Threatens UN plan,* THE TIMES (London), Feb. 4, 2008, at 44.
72. *Id.*

reached."[73] That successor agreement would purportedly include the United States, Japan, China, India, and the emerging markets, without which the price of European carbon permits will soar.[74]

CONCLUSION

The carbon emission trading market for carbon quotas and credits is very sensitive to a slowdown in economic activity, for it cuts production, which means reduction in emissions. Unless there is a comprehensive global agreement on the reduction of carbon emissions, the market will remain complicated, as intense lobbying, both political and corporate, will continue. What about the credibility of this market? Who will monitor and police the system, effectively and internationally?—that is, who will verify the carbon quota and credit entitlements? Obviously it must be done by national governments and the United Nations. The subprime mortgage crisis is a good example of the failure of the needed effective regulatory mechanism. Mechanisms should be such that a long-term, credible carbon price is achieved which encourages companies to invest in low carbon-neutral energy generation.

What have we learned? The first phase of ETS, 2005-2007, which the EU calls the "learning phase," was not a success story. Lobbyists succeeded in getting the EU to allocate carbon credits and allowances to industries too generously. Thus they did not need to buy permits. ETS allowances were given away, resulting in what critics have characterized as massive windfalls for energy-intensive industries.

Phase II began on January 1, 2008, and goes until 2012. It sets tougher targets, although most allowances are still handed out free to industry. During this phase, tighter limits are to be imposed on the number of credits allocated within Europe, but companies will still be able to import credits from the developing countries, which provides them little incentive to achieve emissions reductions.

Finally, the carbon market has seen considerable volatility and price fluctuations for both CERs and allowances, although there is growing interest among investors in the U.S., Canada, Australia, and Japan. Consequently, both the regulated and the unregulated sectors have witnessed a great deal of activitiy. To ensure the emergence of a healthy carbon market, it is essential that policy-makers establish mechanisms to gather accurate market-relevant emissions data and release it in an orderly and transparent manner. They must set the caps consistent with the scientifically credible level of environmental performance and impose strict penalties for fraud or noncompliance They must also give companies maximum flexibility to achieve the emission reduction goals. Effective

73. *Id.*
74. *Id.*

enforcement must also be ensured and strict penalties must be imposed for fraud or noncompliance. The 2007 World Bank study entitled, "State and Trends of the Carbon Market 2007" aptly stated: "The key elements for well-functioning carbon markets include: competitive energy markets; common, fungible units of measure; standardized reporting protocols of emissions data; and transferability of assets across boundaries."[75]

75. KAREN CAPOOR & PHILIPPE AMBROSI, WORLD BANK, STATE AND TRENDS OF THE CARBON MARKET 2007, at 6, *available at* http://carbonfinance.org/docs/Carbon_Trends_2007-_FINAL_-_May_2.pdf (2007) (citation omitted).