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# Political Science and Prediction: What's Next for U.S. Climate Change Policy?

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## Abstract

*This article analyzes how U.S. climate change politics and policy making are changing in the public, private and civil society sectors, and how such changes are likely to influence U.S. federal policies. It outlines the current status of U.S. climate change action and explores four overlapping pathways of policy change: (1) the strategic demonstration of the feasibility of climate change action; (2) the creation and expansion of markets; (3) policy diffusion and learning; and (4) the creation and promulgation of norms about the need for more aggressive climate change action. These four pathways seek to fruitfully draw from rationalist and constructivist approaches to policy analysis, without collapsing or confusing the different logics. Building on this analysis, it predicts that future federal U.S. climate policy will include six major components: (1) A national cap on GHG emissions; (2) A national market based cap-and-trade GHG emissions trading scheme; (3) Mandatory renewable energy portfolio standards; (4) Increased national product standards for energy efficiency; (5) Increased vehicle fleet energy efficiency standards; and (6) Increased federal incentives for research and development on energy efficiency issues and renewable energy development. In addition, expanding federal climate policy may bring about significant changes in U.S. foreign policy as U.S. international re-engagement on climate change is likely to occur only after the development of more significant federal policy.*

**KEY WORDS:** US environmental politics, climate change, institutions, networks, policy prediction

## Introduction

Typically, political scientists are disinclined to predict political and/or policy making outcomes—at least in print. Instead, much political science scholarship seeks to explain events and processes where outcomes are known. Much less often, political science analysis is used for formulating predictions about ongoing and dynamic policy processes with multiple possible outcomes (Sarewitz, Pielke, & Byerly, 2000; Dunn, 2004). In this article, however, we seek to predict main components of future U.S. federal climate change policy, rather than merely analyze existing policy. We ask two broad research questions. First, how are contemporary U.S. climate change politics and policy making changing in the public, private, and civil society sectors? Second, how may such changes influence U.S. federal and foreign policies? Addressing these questions, we analyze drivers and pathways of change and use insights from our analysis to formulate specific policy predictions.

Climate change is a policy area of growing political interest and social science analysis. Political efforts on climate change mitigation (e.g. greenhouse gas (GHG) reduction) and adaptation (e.g. adapting societies to a changing climate) are expanding in many countries, and a growing body of literature examines climate change initiatives and policy making in, for example, Europe, India, China, and Japan (Fisher, 2004; Schreurs, 2002). Across national borders, climate change policy making and policy analyses are based on a general acceptance of the growing scientific consensus about anthropogenic changes to the global climatic system and the warming trend generated by human release of GHGs, most notably carbon dioxide (CO<sub>2</sub>) (Harrison, 2004; Houghton, Ding, Griggs, & Noguer, 2001; Karl &

Trenberth, 2003; Weart, 2003). U.S. climate change politics is also attracting growing scholarly interest (Rabe, 2004; Selin & VanDeveer, 2005), but little of this literature seeks to predict future policy developments in a more systematic fashion.

Persistent opposition by the Bush Administration and a series of Congressional majorities to the Kyoto Protocol and to mandatory federal standards on GHG emission reductions is well documented and hotly debated (Victor, 2004). Yet, a steadily growing number of U.S. states and municipalities have adopted climate change policies that exceed national standards and goals. Likewise, a growing number of large U.S.-based firms, non-governmental organizations (NGOs), and universities are launching GHG reduction programs. Increasingly, U.S. federal climate change politics and policy diverge substantially from those at the state and local level and in many private sector and civil society organizations. This growing divergence, we argue, suggests that the political climate for U.S. national climate policy is changing. This change is largely driven from below.

U.S. climate change policy developments are, of course, social processes shaped by participants' interests and actions, as well as knowledge, norms, and ideas. Our analysis draws on theories and studies from multiple political science subfields, including American politics and public policy analysis, foreign policy analysis, and international relations. In fact, we argue that it is only by building on insights from across these subfields that a sufficient analysis of ongoing developments on climate change policy and politics and their wider impacts can be made. Some theoretical approaches and concepts deployed in this article, such as rationalism, constructivism, and network analysis, are common across the political science subfields. Other approaches and concepts, such as U.S. environmental federalism and public-private coalitions driving U.S. foreign environmental policy, are more directly linked with specific disciplinary subfields.

Our analysis is based on data from multiple sources, including studies of U.S. climate change action and policy, studies of American and international environmental politics and policy making more broadly, climate change related reports issued by research and stakeholder organizations, primary public and private sector documentation, information from public and private sector data bases, and news reports on ongoing climate change action in the United States and elsewhere. In addition, we conducted interviews with public officials, civil servants, and staff members of non-governmental organizations active on climate change action and advocacy. Finally, we attended and observed numerous policy maker and stakeholder meetings related to regional and state/provincial level climate change issues and policy action between 2003 and 2006.

The article begins with a section discussing the status of climate change action in the public sector, civil society, and the private sector. This is followed by an analysis of the role of networks of policy advocates in initiating and driving climate change action from below. Based on this analysis, we identify and discuss four overlapping pathways of policy change that we use to make predictions about six components likely to be included in expanded federal climate policy.<sup>1</sup> In short, our predictions assume that policies that are currently developed and implemented in states, municipalities, and firms and thereby gaining important political constituencies are most likely to be adopted at the federal level. In addition, we examine implications of more aggressive federal climate policy for U.S. foreign policy, arguing that

serious U.S. international re-engagement on climate change is likely to occur only after the development of more significant federal policy.

## **Climate Change Action in the United States**

Since 2001, climate change politics has been changing in a host of U.S. political arenas. By 2005, several observers were making public claims about the sharp acceleration of climate change-related initiatives in the public, private, and civil society spheres (New York Times, 2005; Rabe, 2004; Kriz, 2005).<sup>2</sup> In this section, we discuss the state of U.S. climate change action in the public sector, in civil society, and in the private sector.

### **Public Sector**

Public sector data are organized in groups of federal, state, and municipal action and policy.

*Federal Policy*—President Bush outlined major principles of current federal climate policy in his “Global Climate Change Initiative” in February 2002 (White House Press Office, 2002). Federal policy consists of three main elements (Bang, Tjernshaugen, & Andresen, 2005). First, it focuses on “GHG intensity” as measured by emissions/gross domestic product, and the goal is to gradually reduce the GHG intensity of the U.S. economy. However, even if this goal is reached, GHG emissions are likely to continue to rise in absolute terms as a result of national economic growth (Environment News Service, 2005, May 4).<sup>3</sup> Second, the Bush administration remains opposed to mandatory GHG emissions reductions, leaving federal climate change policy focused on voluntary programs and research. Third, federal programs support the continued scientific study of climate change and the development of emissions reducing technologies.

To these ends, the Climate Change Science Program (CCSP) and the Climate Change Technology Program (CCTP) were created in 2002. In 2003, CCSP released a ten year strategic research plan, which envisions support for better monitoring of the climate, seeks to study causes of climate change, and outlines a strategy for investing in tools to aid policy making (Victor, 2004). However, availability of resources is critical for effective implementation, and Victor has noted that “the grand vision of CCSP is much larger than the budget available” (Victor, 2004, p. 19). CCTP is tasked with creating and implementing a research and development program for climate change related technology, and the United States is a main investor in emissions reduction technology (Bang, Tjernshaugen, & Andresen, 2005).

Congress has consistently opposed mandatory GHG controls with staunch opposition from post-1994 Republican leaders. In July 1997, the Senate passed the Byrd-Hagel resolution by 95-0, opposing any international climate change treaty that did not include meaningful participation and commitments from developing countries. According to most Senators, the Kyoto Protocol did not pass this test.<sup>4</sup> Senator Inhofe, former Chair of the Senate Committee on Environment and Public Works, has moreover described global warming as “the greatest hoax ever perpe-

trated on the American people” (Kolbert, 2005; 2006). In 2003, the Climate Stewardship Act, sponsored by Senators Lieberman and McCain, garnered more support than many analysts expected, but was defeated 55-43. The bill sought to reduce GHG emissions through, among other things, a cap-and-trade scheme for the utilities sector (Aulisi, Farrell, Pershing, & VanDeveer, 2005).<sup>5</sup>

In 2005, several proposals to establish mandatory GHG emissions caps and/or reductions were voted down in the Senate during debates on national energy legislation—including a re-introduced version of the McCain-Lieberman bill, which this time garnered only 38 supporting votes. Yet, the Senators passed (with 54 votes) a “Sense of the Senate” nonbinding resolution declaring that human activity is causing climactic changes and that mandatory steps will be necessary in the future. These 2005 Senate debates were easily the most substantial Congressional debates about global climate change and its impacts to date. Generally, proposals of mandatory GHG emission reductions have faced even stronger opposition in the House of Representatives than in the Senate (Hulse, 2005; Bang, Tjernshaugen, & Andresen, 2005).

Instead, U.S. public sector leadership around climate change is generally found at state and municipal levels, in the private sector, and in civil society. Here, an acceptance of the science of anthropogenic climate change has resulted in a gradual changing of debates about climate change from “should we do anything?” to “what should we do?”.

*State Action*—A great deal of progressive climate change action is developing within and among U.S. states (Rabe, 2004; Selin & VanDeveer, 2005). Furthermore, large U.S. states emit as much GHGs as many major industrialized countries. Texas emits more GHGs than United Kingdom and Canada. California emissions are higher than Brazil’s and Spain’s. U.S. medium sized and smaller states emit as much as most European countries and many larger developing countries. For example, Massachusetts emits GHG emissions roughly equal those of Austria, Greece, or Egypt (Rabe, 2004; Selin & VanDeveer, 2005). State policy makers can influence the generation of GHGs across multiple areas, including energy and electricity production and use, transportation, land planning and use, agriculture and forestry, and waste management (Rabe, 2004).

The Pew Center on Global Climate Change lists programs in over 30 U.S. states related to climate change (<http://www.pewclimate.org>). Many state leaders explicitly argue that states should lead because of lagging federal policy making (Selin & VanDeveer, 2005). In these cases, state officials often act based on an acceptance of the science behind anthropogenic climatic change and information about local consequences of a changing climate. Examples are found in many states that are traditional leaders on environmental policy development, including those in the Northeast, the Great Lakes regions, and along the Pacific coast.

Yet, state level climate change policies can also be found in states not often associated with environmental policy leadership. These include Michigan’s 2005 issuance of a state GHG inventory and Texas’ support for renewable energy development (Rueter, 2005; Rabe, 2004). By June 2006, 28 states had issued climate change action plans, nine had issued state-wide GHG reduction targets, 22 states and the District of Columbia had mandated that electric utilities generate a specific

minimum amount of power from renewable energy sources (so called renewable portfolio standards) be increased over time, and about half of all states had established public funds to support energy efficiency and/or renewable energy development (Pew Center on Global Climate Change, 2006).<sup>6</sup> In addition, many states have developed building and product standards and issued rules for public sector purchasing designed to reduce energy use and CO<sub>2</sub> emissions.

Multiple governors have formulated GHG reduction goals. For example, New Jersey in 1998 committed to reduce GHG emissions by 3.5% below 1990 levels (New Jersey Climate Change Work Group, 2002). Under a June 2005 executive order, California Governor Schwarzenegger set out to reduce GHG emissions to 2000 levels by 2010, and reach 1990 levels by 2020 with the long-term goal of reducing emission to 80% below 1990 levels by 2050 (Schwarzenegger, 2005; Bustillo, 2005; Rogers, 2005; Environment News Service, 2005, June 2). In 2006, Gov. Schwarzenegger and the California legislature agreed to increase the state's goals, calling for a 25% reduction in emissions by 2020 that relies on emissions controls on large industrial sectors such as utilities, oil refining, and cement production (Barrington, 2006). In addition, California has launched an initiative to regulate CO<sub>2</sub> emissions from vehicles (Farrell & Hanemann, unpublished).<sup>7</sup>

Many states are also working together to establish and implement GHG reduction goals and support energy efficiency and renewable energy development. Eight different regional groups of states have such efforts underway, while the most ambitious are found in the northeast (Pew Center on Global Climate Change, 2004). In 2001, the six New England states committed to reduce their GHGs to 1990 levels by 2010 and 10% below 1990 levels by 2020. They moreover pledged to ultimately decrease emissions to levels that do not pose a threat to the climate, which according to an official estimate would require a 75–85% reduction from 2001 emissions levels (Selin & VanDeveer, 2005). A second effort, the Regional Greenhouse Gas Initiative (RGGI), remains in development. In 2006, Maine, Vermont, New Hampshire, Connecticut, New York, New Jersey, and Delaware were RGGI members. Maryland is committed to join in 2007 (<http://www.rggi.org>).

RGGI was proposed by Governor Pataki of New York in April 2003. After lengthy negotiations among state officials and extensive data gathering and analytical modeling, a joint Memorandum of Understanding was adopted in December 2005. RGGI will create a regional emissions inventory, registry, and trading mechanism for CO<sub>2</sub> emissions from power plants (states may also get credits for emissions reductions achieved outside of the electricity sector). A detailed “model rule” was finalized in August of 2006. RGGI is designed to stabilize CO<sub>2</sub> emissions from the start of the program in 2009 through 2015. From 2015 to 2018, each state's annual CO<sub>2</sub> emissions budget will decline by 2.5% per year, achieving a total 10% reduction by 2019. The RGGI states have committed to issue necessary state regulations (and in some cases seeking legislative authority) before 2009. RGGI members also agreed to attempt to recruit additional states' participation, and Governor Schwarzenegger in October 2006 announced his intention to link California to RGGI (Young, 2006).

In additional state-driven GHG mitigation efforts, several states have initiated legal processes against the U.S. federal government for its refusal to introduce mandatory regulations on CO<sub>2</sub> emissions. In February 2003, Attorneys General from California, Connecticut, Illinois, Maine, Massachusetts, New Jersey, New

Mexico, New York, Oregon, Rhode Island, Vermont, and Washington filed a legal suit in federal court challenging the Bush Administration's decision to exclude CO<sub>2</sub> as a pollutant to be regulated under the 1990 Clean Air Act Amendments. Many state regulatory agencies, city officials, and environmental groups have endorsed and support this initiative. The US Supreme Court agreed in June 2006 to make a later ruling on the federal government's obligation to control CO<sub>2</sub> emissions from vehicles based on review request from Massachusetts and 28 other parties (Janofsky, 2006; Hileman, 2006).

Whereas much state action responds directly to climate change concerns, some state actions that reduce GHG emissions are not explicitly linked to climate change. In fact, some officials believe that any explicit linkage to the climate issue would hurt the development of the policy they desire (Rabe, 2004). For example, Texas' policy makers focus on issues of economic competitiveness and development as they diversify energy generation by promoting and investing in renewable energy sources. Nebraska, seeking to create a long-term basis for economic growth, is developing land use and agricultural policy that benefits carbon sequestration, hoping that this will benefit Nebraska under a possible future GHG emission trading scheme. Nevertheless, such efforts and programs serve to reduce GHG emissions and demonstrate the viability of such policy action.

*Municipal Action*—The number of American municipalities initiating climate change policy action also continues to grow. Municipal climate change related initiatives are often independent of state action. Instead, municipal climate change action develops largely through municipal based activism and leadership, from New York City to small and medium sized cities and towns. Many municipalities developing climate change policy are members of the International Council for Local Environmental Initiatives (ICLEI), which was formed in 1990 by the International Union of Local Authorities and the United Nations Environment Programme. In 1993, ICLEI established the Cities for Climate Protection program (CCP), which allows municipalities to work together on climate change issues through decentralized cooperation (Betsill & Bulkeley, 2004).

As of mid-2006, the CCP program had 674 participating local governments in 30 countries across the world that collectively are responsible for approximately 15% of global GHG emissions (<http://www.iclei.org>). Over 150 of these members are located in the U.S. In joining the CCP program, municipalities commit to fulfill five interrelated tasks: i) conduct an energy and emissions inventory and forecast; ii) establish an emissions reduction target; iii) develop an action plan to reach this target; iv) implement policies and measures to reach the set emissions reductions; and v) create a process for monitoring and verifying results. These steps contribute to creating a local platform for initiating, implementing, and assessing action to reduce GHG emissions in municipalities across the United States.

Municipal interest in climate change issues further accelerated in 2005 as Seattle Mayor Greg Nickels led an effort to get mayors to adopt U.S. commitments under the Kyoto Protocol (e.g. a 7% reduction from 1990 emissions levels by 2012), and called on the federal government to enact more stringent legislation to reduce GHG emissions (Sanders, 2005; Environment News Service, 2005, June 13). This effort led to the unanimous passage of a resolution by the U.S. Conference of Mayors at



their June 2005 meeting declaring their intention to meet or exceed the U.S. emissions reductions called for in the Kyoto Protocol, and urging also state and federal governments to meet these goals (Caterinicchia, 2005). By July 2006, over 275 mayors representing more than 48 million Americans had accepted this challenge.<sup>8</sup> The U.S. Conference of Mayors moreover established cooperative links with ICLEI's CCP program.

Some municipalities have made considerable progress in reducing GHG emissions. For example, total emissions in Portland, Oregon and its home county fell below 1990 levels in 2003, despite continuing population and economic growth since 1990 as per capita emissions in 1990–2003 went down 13% (de Steffey, Sten, & Sten, 2005). Similarly, Hull, Massachusetts has commissioned the construction of two wind turbines (in 2001 and 2006), saving the town hundred of thousands of dollars each year and averting hundreds of tons of CO<sub>2</sub> emissions (Johnson, 2006). Both Oregon and Hull report dozens of inquiries from other municipalities about their programs and achievements. The Climate Group is also highlighting many other municipal successes in meeting GHG reductions in reports and conferences designed to engender additional cities and towns to set and achieve GHG reductions commitments (<http://www.theclimategroup.org>).

### **Civil Society**

In their critical essay, *The Death of Environmentalism*, Michael Shellenberger and Ted Nordhaus argue that the U.S. environmental movement has largely failed on climate change issues (Shellenberger & Nordhaus, 2004). Despite growing membership, NGOs have had little impact on federal climate change policy and the national debate. NGOs working on climate change issues include both established environmental organizations such as the Sierra Club, Environmental Defense, the National Resources Defense Council, and new organizations that specifically focus on climate change such as Clean Air—Cool Planet (<http://www.cleanair-coolplanet.org>). Nevertheless, recent increases in civil society activity around climate change issues include initiatives by environmental NGOs, research institutes, and private foundations.

Many observers believe that lagging climate change advocacy among NGOs and the U.S. public is a critical factor explaining the slow initiation of federal climate change policy action (Shellenberger & Nordhaus, 2004). Michael Purdy, Director of the Lamont-Doherty Earth Observatory at Columbia University, argues that the main reasons for American inaction on climate change are “the lack of public knowledge, the lack of leadership, and the lack of political will” (Carey, 2004, p. 69). A March 2005 Gallup Poll asked Americans how well they believed that they understood the issues of global warming. Only 16% of respondents said “very well,” 54% said “fairly well,” 24% said “not very well,” and 6% “not at all.”<sup>9</sup> Although polls should be interpreted cautiously, many analysts have stressed the need for better public education and improved communication between scientific and technical experts and the general public (Skolnikoff, 1999; Victor, 2004; Moser & Dilling, 2004).

Public attitudes are important. According to the Environmental Protection Agency, roughly 32% of per capita emissions are affected by personal decisions.<sup>10</sup>

Tackling the other 68% of GHG emissions will require public support for, or acceptance of, emissions reduction policies. Based on past shortcomings, many environmental NGOs are designing new strategies for their advocacy work, often focusing on local and regional areas rather than the federal level. In New England, for example, NGOs pool resources under the New England Climate Coalition.<sup>11</sup> This Coalition prepares respected assessment and policy reports and coordinates lobbying and public awareness campaigns (New England Climate Coalition, 2003).<sup>12</sup> NGOs and foundations also organize workshops and conferences attended by public and private sector stakeholders. Such gatherings are designed to generate data and ideas that are used to influence public and corporate policy.

Private foundations also show growing support for climate change initiatives. A 2005 Marshall Institute study found that annual foundation support for climate change research, analysis and advocacy is in the range of \$35–50 million—the vast majority of which goes to organizations favoring restrictions on CO<sub>2</sub> emissions (Kueter, 2005). Such support has, for example, helped to sponsor local, state, and regional efforts to address climate change in the Northeast, Great Lakes, and West Coast regions. Foundations, including the Energy Foundation, Pew Charitable Trusts, Hewlett Foundation, Turner Foundation, Packard Foundation and the Rockefeller Brothers Fund are major supporters of research and advocacy by environmental NGOs and environmental think tanks and consultancies focused on engendering states and local climate change planning and policy making.

The increase in local level climate change action is receiving much media coverage. Since 2004, a diverse set of U.S. publications including *Business Weekly*, *National Geographic*, *Fortune*, *Time Magazine*, *Scientific American*, *Rolling Stone*, *ELLE*, *U.S. News & World Report*, *Parade*, *Atlantic Monthly* and *the New Yorker* have run feature articles on climate change. All these stories argued that climate change is an important policy issue and were generally supportive of more extensive mitigation policy. In addition, several major newspapers have opined in favor of stronger GHG policy, including the *Boston Globe*, the *New York Times*, the *Washington Post*, the *Los Angeles Times*, the *St. Louis Post-Dispatch*, the *Atlanta Journal-Constitution*, and the *Denver Post*. Scientific studies of causes and effects of climate change informed much of this news coverage, as did former Vice President Al Gore's documentary "An Inconvenient Truth" (<http://www.climatecrisis.net>).

### **Private Sector**

In the 1990s, many major America corporations and trade associations led the opposition against mandatory GHG emissions reductions in the U.S. and internationally (Levy, 2005; Skjearseth & Skodvin, 2001). In recent years, however, numerous U.S. companies have initiated measures to reduce their GHG emissions (Aulisi, Layke, & Putt del Pino, 2004; Eizenstat & Kraiem, 2005). The Business Environmental Leadership Council of the Pew Center on Global Climate Change consists of 41 major companies from North America, Europe, and Japan that believe that business engagement is critical for developing effective solutions to climate change. Members include a diverse set of companies from the energy, manufacturing, financial services, and technology sectors. Similarly, The °Climate Group is an international non-profit organization whose 26 members include major private



companies and public entities that have pledged to “achieve significant reductions in GHG emissions.”<sup>13</sup>

Many corporate leaders discover that reducing GHGs can save substantial amounts of money. For example, BP added \$650 million in shareholder value by cutting its GHG emission to 10% below 1990 levels (Browne, 2004). Corporate executives also prepare for what they believe will be a future carbon constrained economy (World Resources Institute, 2005; Carey, 2004). General Electric will double its investment in clean products to \$1.5 billion annually by 2010 with the goal of doubling its revenues from energy efficient products (Barringer & Wald, 2005; Immelt & Lash, 2005; Economist, 2005, December 8). Moreover, the increasing adoption of state-level renewable portfolio standards creates business opportunities for companies that are involved in renewable energy generation. Climate concerns may also offer new possibilities for the nuclear power industry (Carey, 2004). In addition, climate change offers both financial challenges and possibilities to the insurance and re-insurance business (Dlugolecki & Keykhah, 2005; Dlugolecki, 2004; Hauffer, unpublished).

Another private sector initiative is the creation of a voluntary market for CO<sub>2</sub> emissions permits, the Chicago Climate Exchange (CCX), which opened in December 2003 (<http://www.chicagoclimatex.com>). Membership has grown significantly from 23 firms in late 2003 to 210 by mid-2006, and includes corporate giants such as DuPont, Ford, and Motorola (Economist, 2006, August 5). Members commit to reduce their North American emissions by one percent every year for four years. Some have already made considerable progress, with DuPont reducing its emissions by 72% below 1990 levels (Goodell, 2006). Members join CCX because they recognize the climate change problem and for strategic reasons. By joining, companies get valuable experiences in managing GHG emissions, they position themselves at the frontline for a future mandatory trading system they believe will be created, and they hope to reap public relations benefits (Goodell, 2006).

The number of consultancy and accounting firms offering their services to private and public organizations that want to participate in credit and/or offsets schemes for CO<sub>2</sub> reductions is growing sharply.<sup>14</sup> In fact, \$2.7 billion in offsets were sold in 2005 (Economist, 2006, August 5).<sup>15</sup> In other words, a market for such services is developing rapidly. Finally, news reports suggest that higher oil prices and the expectations of future carbon controls are pushing significant increases in the amount of venture capital invested in firms developing or deploying technologies that reduce GHG emissions (Rivlin, 2005; Weisman, 2006).

### **Analysis, Part I: Institutionalizing Networks**

This rapid growth in climate change initiatives catalogued above cannot be explained without attention to expanding networks of actors driving activities across public, private, and civil society sectors (Selin & VanDeveer, 2005; Betsill & Bulkeley, 2004). Similarly, analysis of advocacy networks has proven useful for studying policy developments on climate change in Europe and international politics (O’Riordan & Jordan, 1996; Jost & Jacob, 2004; Duwe, 2001). Network analysis is applied across social science disciplines to study complex relations between actors that may span public, private, and civil society sectors (Börzel, 1998; Dowding,

1995). In all these disciplines, network analysis examines how participants move information and ideas and build coalitions to shape policy processes and outcomes. That is, actors seek to channel data and policy innovations and expand their influence through their institutionalized networks.

In the public policy literature, Sabatier and Jenkins-Smith use an advocacy coalition framework to analyze how groups of public, private, and non-governmental actors develop, interact, and shape policy within issue-based policy processes (Sabatier, 1988; Sabatier & Jenkins-Smith, 1993). In the international relations literature, Keck and Sikkink likewise define networks as groups of activists motivated by shared values who seek to change policy through their advocacy work (Keck & Sikkink, 1998). Applying their analysis to issues of human rights, Keck and Sikkink demonstrate that activist networks linking public, private, and civil society actors across border can be a powerful force of change. The importance of networks of policy advocates have also been noted in studies of such diverse issue areas such as the creation of the treaty banning the use of landmines, European air pollution policy, and hazardous waste management (Price, 1998; Selin & VanDeveer, 2003; Iles, 2004).

The importance of well-networked entrepreneurial leaders across public, private, and civil society spheres is apparent in much state and local level climate change action (Rabe, 2004; Betsill, 2001; Bulkeley & Betsill, 2003). Often, it is not simply a matter for local policy advocates to calculate how to advance well defined interests, but to develop those interests in the first place. In other words, the formation of actor's interests and preferences and the reaching of shared understandings around climate change action are deeply intertwined, and both individual interests and shared understandings involve through collective interaction and learning processes (Wendt, 1994; Stryker, 1987). Many network members are motivated by environmental concerns, but they also seek to build coalitions with individuals and organizations who may gain from more aggressive climate change policy but may not necessarily share their environmental concerns.

Many climate change oriented advocacy networks are structured around key organizational nodes. Municipal leaders use ICLEI's CCP program and the U.S. Conference of Mayors. At the state level, a majority of U.S. states are working within at least one regional group of states to address some aspect of climate change (Pew Center on Global Climate Change, 2004; Bourne, 2004; King, Sarria, Moss, & Numark, 2004). Municipal and state level officials are also connected through regional and national professional associations. Other organizational nodes function as institutionalized connections between public, private, and civil society spheres. These include the PEW Center on Global Climate Change, The °Climate Group, the Center for Clean Air Policy, NGO coalitions such as Clean Air-Cool Planet and the New England Climate Change Coalition, climate change donor groups among private foundations, and various associations for private sector interests such as the Environmental Markets Association.

Networked climate change policy advocates use their networks to distribute information, gain support, generate policy ideas, and push their respective leaders in municipalities, states, and organizations to initiate and keep on developing climate change action (Selin & VanDeveer, 2005). That is, climate change advocates in one municipality, state or company engage in coalition building and use developing

action elsewhere to leverage similar action within their jurisdiction or organization. Lessons from the various local, state, and private sector efforts on climate change action are also increasingly acknowledged and mined by actors in other jurisdictions and organizations (Selin & VanDeveer, 2005). In fact, organizations such as the U.S. Conference of Mayors, ICLEI, and the Pew Center on Global Climate Change are expressly designed to facilitate discussions, information sharing, and learning among concerned actors—not just those who are already members.

Studies of U.S. environmental politics demonstrate that collaboration between private and public sector actors often influences policy outcomes (DeSombre, 2000; Layzer, 2002). As such, there is reason to pay close attention to developing public-private collaboration on climate change such as the CCX and The °Climate Group, whose members come from both the private and public sectors. A growing number of company executives join climate policy advocates as outspoken supporters of more stringent federal climate policy, including mandatory emissions regulations (Barringer & Wald, 2005; Immelt & Lash, 2005; Carey, 2004; Browne, 2004). Private-public partnerships are also calling for energy policy changes that would address GHG emissions in conjunction with other energy concerns. Here, advocates of energy policy reform find common ground with many climate change advocates on such issues as energy efficiency, national CO<sub>2</sub> emissions caps, automobile and equipment standards, and research and development incentives and funding (Economist, 2005, April 30).

Thus, advocates of climate change action and energy policy reform are expanding their respective coalitions and networks to include more cross-sectoral actors and interests. Thomas Friedman refers to the growing number of environmentalists, energy policy reform advocates, and national security analysts with overlapping interests as “geo-greens.” In common, they argue that U.S. reliance on foreign petroleum poses a risk to national security where a reduced dependency on petroleum is also desirable from a climate change mitigation perspective (Friedman, 2005). One of the most politically prominent manifestations of this line of reasoning is found in the National Commission on Energy Policy’s recommendation that the creation of a cap-and-trade scheme for GHG emissions should be part of a new U.S. energy policy designed to simultaneously reduce foreign energy dependence (to address security concerns) and begin to address climate change (National Commission on Energy Policy, 2004).

Recently, analysts have also noted that many religious organizations seem increasingly concerned about climate change and inclined to join coalitions with climate change advocates and energy and security analysts (Friedman, 2005; Harden, 2005; Goodstein, 2005). Some leaders within the evangelical movement argue that climate change is a “values issue” to which the approximately 30 million evangelicals in the U.S. ought to pay more attention. At a meeting on Capitol Hill in March 2005 of religious leaders and policy makers, Senator Lieberman noted: “Support from the evangelical and broader religious community can really move some people in Congress who feel some sense of moral responsibility but haven’t quite settled on an exact response yet. This could be pivotal” (Goodstein, 2005). Yet, many evangelical leaders are skeptical of the environmental movement and the word environmentalism for many evangelicals “connotes liberals, secularists and Democrats” (Harden, 2005).

To engage more public interest in climate change, many local officials and NGOs moreover seek to better connect climate change issues to specific local and personal frames of references (Yarnal, O’Conner, & Shudak, 2003). In other words, they attempt to use discursive strategies and issue framing to expand and strengthen coalitions that pursue intensified climate change policy action (Schön & Rein, 1994; Surel, 2000). For example, the New England based NGO Clean Air—Cool Planet designed and distributes “Save Our Syrup: Stop Global Warming” bumpers stickers to link climate change in New England to maple syrup production, a value laden New England symbol. In addition, arguments by Friedman’s geo-greens connect local public and private choices with respect to energy production and use with national (and international) energy, security, and climate change issues, showing how these issues are interrelated across scales.

## **Analysis, Part II: Pathways of Policy Change**

The existence of networks does not, in itself, explain the influence of the agents within them. In fact, a common criticism of the literature on networks is that it often only vaguely connects agency and causality and, as Tarrow has noted, often under-specifies the relationships between networks and states (Tarrow, 2001; Dowding, 1995; O’Neill, Balsiger, & VanDeveer, 2004). Thus, scholars employing network analysis must identify and specify exactly *how* network participants exercise influence. Drawing on multiple strands of social science literature, we argue that expanding networks of climate change advocates influence local and national decision making and policy through four pathways: (1) the strategic use of demonstration effects, (2) market pricing and expansion, (3) policy diffusion and learning, and (4) norm creation and promulgation (Selin & VanDeveer, 2005).

The first two pathways are grounded in assumptions about rational actor’s interests and strategic behavior sometimes called “consequentialist logic” (Risse, 2002a; Schimmelfennig, 2002). These are widespread in the political science literature that views actors as rational utility maximizers who operate strategically to achieve their goals. In contrast, pathways three and four are generally drawn from constructivist approaches (sometimes referred to as “the logic of appropriateness”) (Risse, 2002a; March & Olsen, 1998; Schimmelfennig, 2002). These approaches examine the roles of knowledge, ideas, norms, and interactions among agents for policy making and reaching of shared understanding. As such, the four pathways seek to fruitfully draw from rationalist and constructivist approaches to policy analysis, without collapsing or confusing the different logics. That is, the pathways include combinations of rational and constructivist logics to encompass the “games real actors play” (Scharpf, 1997; Risse, 2002a).

### ***The Strategic Use of Demonstration Effects***

Climate change policy advocates strategically draw attention to specific policy developments for demonstrational purposes. Opponents of climate change policy action often argue that the costs of GHG mitigation are either prohibitively high, or higher than expected benefits. Some skeptics, including President Bush, believe that climate change policy actions like those included in the Kyoto Protocol would “wreck” the U.S. economy (Weinberg, 2005). Advocates of climate change policy

action in the public, private, and civil society sectors, however, cite a growing list of existing policy initiatives in the U.S. and abroad as evidence that climate change policy is both desirable and feasible. To date, climate change advocates argue, no national or local industrialized economy has been seriously damaged by efforts to cap and then reduce GHG emissions.

U.S. states often act as environmental policy innovators, influencing subsequent federal environmental standards and policy (Rothenberg, 2002; Rabe, 2003). Many climate change policy advocates also seek to upload developing local public sector and private sector policies to the federal level. Pioneering efforts in the public and private sectors are important because they demonstrate the technical and economic feasibility of policies to address climate change. Forerunner states, municipalities, and private companies are often explicit about their desire to lead by example in the face of lagging federal standard setting and policy making. For example, in 2003, Maine Governor John Baldacci noted that the regional effort across New England and eastern Canada “cannot save the world, but [can] send a ripple across the continent.” He urged the region to “raise the bar” for national policies in the United States and Canada.<sup>16</sup> Such efforts also include legal challenges against the federal government for not regulating CO<sub>2</sub> emissions.

Many climate change advocates in public and private sectors draw attention to the multitude of new climate change initiatives to demonstrate the viability of more aggressive climate change action.<sup>17</sup> For example, many states and municipalities have initiated energy efficiency and conservation programs. Many states work with utility companies to reduce GHG emissions and intend to gradually increase their mandatory renewable portfolio standards. California moreover has moved to include CO<sub>2</sub> regulation in their transportation standards, and numerous state officials have indicated that they would adopt the new California standards if they are enacted (Cain, 2005). In addition, an increasing number of U.S. companies have initiated GHG reduction programs. In doing so, many have identified significant options for more effective corporate policy, generating a growing interest in less energy intensive production and green buildings, for example.

As more public and private sector actors take action on climate change and energy issues, interest in more efficient energy production and use is likely to remain strong—especially in the face of high and volatile energy prices (National Commission on Energy Policy, 2004). If they reduce GHG emissions even as they sustain economic growth (which is their stated goal), supporters of more stringent climate change action can be expected to carefully study these accomplishments and use them to argue for the feasibility of increased federal action. Thus, over time, opponents of climate change action are likely to find it more difficult to resist mandatory GHG reduction policies by claiming that they are unaffordable or unfeasible. In addition, programs developed within municipalities, states, and private companies are likely to serve as important models for future national standards and policy.

### ***Market Expansion and Pricing***

Often, advocates of climate policy seek to exploit and/or alter market dynamics. For example, many state and local level initiatives mandate greater use of renewable

energy and the purchase of higher efficiency products by public authorities (e.g. appliances and vehicles). Many firms and NGOs have similar policies in place designed to regulate their internal purchasing. Such policies can expand markets for more energy efficient products, offering the potential to push down prices and make such products more economically competitive. As states and municipalities mandate higher energy efficiency standards, this can be expected to increase the size of related markets. If energy efficient products and techniques decline in price relative to less efficient ones, this too would undermine claims about the economic and social disasters engendered by GHG emissions reduction policies made by many opponents of climate change policy.

Market issues are also central in efforts to develop cap-and-trade schemes. If the RGGI effort among the Northeast states and California comes to fruition, it would help reveal an actual price for particular CO<sub>2</sub> reductions, thereby moving beyond existing assessments that often only estimate these costs. This, in turn, would allow companies to better budget costs and benefits associated with particular GHG reductions. Also, if there were an effective carbon market in the United States, more firms that believed they would be competitive on the market are likely to join the trading scheme, given relatively low entry and transaction costs. Similarly, additional states may seek to join a regional trading mechanism if it is successful, thereby expanding its geographical coverage. The experience in the northeast with the development and expansion of the NO<sub>x</sub> trading scheme suggests that this is a distinct possibility (Aulisi, Farrell, Pershing, & VanDeveer, 2005).

Discussions about regional GHG trading schemes have induced a growing number of corporate leaders calling for a national cap-and-trade scheme, rather than multiple regional and/or state emissions caps. This development is similar to developments and discussions in the late 1980s on sulfur dioxide. Then, many states created their own (different) sulfur dioxide regulations, resulting in increased corporate support for the introduction of a single, national scheme in the Clean Air Act amendments of 1990 (Carey, 2004; Munton, 1998). Rather than operating in an environment characterized by regulatory fragmentation, companies desired regulatory uniformity. The growing number of sub-national climate related initiatives has established multiple requirements with which companies must comply, and an expansion of federal climate policy would create greater regulatory uniformity, including in the area of emissions trading (Browne, 2004; Victor, House, & Joy, 2005).

Wayne Brunetti, CEO and chairman of Xcel Energy, one of America's largest electricity and gas utility companies, argues that the national trading scheme for sulfur dioxide that was created in the 1990s is "a great example of what can be done." Speaking about GHG mitigation in 2004, Brunetti stated "give us a date, tell us how much we need to cut, give us the flexibility to meet the goals, and we'll get it done" (Carey, 2004, p. 64). Jeff Imelt, CEO of General Electric, noted that his firm and many others must invest in the development of energy efficient technologies and renewable energy technologies to stay competitive in U.S. and international markets, particularly in light of developing policies in Europe (Imelt, 2005). The growing number of consulting firms specializing in GHG emissions trading services also suggests that entrepreneurial actors believe that the demand for such services is growing.



Of course, support for a trading scheme is linked with a general private and public sector interest in market based policy instruments. Even though some economic theory argues that emission taxes are a superior economic instrument to an emissions trading program, most networked public and private sector actors are committed to an emissions trading program (Cooper, 1998; McKibbin & Wilcoxon, 2002; Pizer, 1997). Such a program would create new markets with associated property rights to be priced in the market, rather than establish a new tax scheme that would be a much harder sell politically. These economic and political drivers were also behind the creation of the U.S. national SO<sub>2</sub> trading program and the recent European CO<sub>2</sub> trading program as opposed to SO<sub>2</sub> and CO<sub>2</sub> tax schemes. BP has also operated internal trading-like programs for reducing their GHG emissions (Victor & House, 2006). Meanwhile, CO<sub>2</sub> tax policies have few identifiable supporters in the public or private sectors.

### ***Policy Diffusion and Learning***

Climate change networks operate as central vehicles for policy diffusion and learning as a third pathway of influence. Large and complex social science literatures address issues related to policy-relevant learning (viewed as cognitive change driven by experience and information) and the diffusion (or spread) of policies and the information and ideas related to them within political systems (Social Learning Group, 2001; Lopes & Durfee, 1999; Haas, 2004; Knill, 2005).

Social learning provides one pathway through which policy ideas and knowledge are diffused. Social learning describes processes by which clusters of actors/stakeholders who work together in an issue-area jointly recognise the relevance and validity of new information leading to a new set of shared understandings. Then, the underlying change mechanism is learning through and during interaction and communication (Wendt, 1999; Knill, 2005). That is, actors' specific interests in climate change related issues emerge in relation to, and in interaction with stakeholders. Integral to this mutual construction of interests, actors develop and internalize norms on climate change abatement and draw important policy lessons. In this respect, climate change networks function as central vehicles for facilitating policy diffusion and learning.

Studies demonstrate that environmental policies among leading U.S. states, municipalities and/or firms frequently serve as models (explicitly and implicitly) for subsequent initiatives by other such actors and federal policy makers (Rothenberg, 2002; Rabe, 2003). In such cases, policy ideas and information are diffused as actors learn from others' experiences. For example, U.S. federal environmental policies on toxics and air and water pollution have been modeled after programs in environmental leader states. In these and other cases, sub-national policy experiences served as laboratories for policy innovation within U.S. environmental federalism. Similarly on climate change, a growing body of evidence suggests that policy lessons from one jurisdiction or organization often are emulated as others seek to develop policies on, for example, energy and electricity generation, emissions reduction, transportation, and land use (Rabe, 2004).

Many networks and organizations are explicitly designed to facilitate policy diffusion and learning on climate change, including ICLEI's CCP program, the

U.S. Conference of Mayors, the PEW Center on Global Climate Change, and the NGO coalition Clean Air-Cool Planet. Joint efforts among regional groups of states moreover explicitly seek to encourage learning between states. Likely one of the most important cases of policy diffusion, in the short to medium term, can be found in the diffusion of the principles and means for developing of municipal and state emissions inventories and registries. In addition, the creation of state emissions inventories and registries are underpinning the RGGI initiative of developing a regional trading scheme. As policy innovations accrue ideas and experience over time, important lessons are learned which are likely to shape future policy, including at the federal level.

### ***Norm Creation and Promulgation***

A fourth pathway of policy influence lies in the creation and promulgation of norms related to climate change action and policy. Literature on environmental protection and human rights demonstrates that normative change over time can be a powerful influence on policy making, as norms shape policies and behaviors that are viewed as “appropriate” (Cass, 2005; O’Neill, Balsiger, & VanDeveer, 2004; Risse, 2002b; Cortell & Davis, 2000; Finnemore & Sikkink, 1998). A growing number of local political leaders and corporate executives in the U.S. have publicly declared that they believe that human behavior has a discernable influence on the climate, arguing for political measures beyond those mandated by the federal government to act more aggressively to reduce GHG emissions. California Governor Arnold Schwarzenegger summed up the views of many when he stated in 2005 as he presented his climate change action plan: “I say the debate is over. We know the science, we see the threat, and the time for action is now” (Bustillo, 2005; Rogers, 2005).

The belief that reducing GHG emissions “is the right thing to do” is underpinned by an acceptance of the science behind human-induced climate change. Local action draws heavily on reports from the Intergovernmental Panel on Climate Change, national U.S. assessments and studies, as well as data from regional research institutions (Selin & VanDeveer, 2005). In addition, the Kyoto Protocol has acted as political stimuli for municipal and state level GHGs reductions, although many short-term local goals are more modest. This is largely an expression of political realism—U.S. GHG emissions have increased since the adoption of the Kyoto Protocol making it difficult to set and reach Kyoto equivalent goals for 2012 in early to mid 2000s. The transfer of ideas and information from international and national sources often moves through network participants—people who Litfin (1994) calls “knowledge brokers”—into local reports and policy (Selin & VanDeveer, 2005).

If climate advocates succeed in generating a broader political and public expectation that GHG emissions should decline over time, then policies and behaviors that reduce GHG emissions will be judged more appropriate than those that engender increases. Evidence suggests that such change is under way. A growing number of municipalities, states, and private companies use networks, programs, and organizations to collaborate on climate change issues. They use these forums to design climate change related efforts that build on existing localized concerns with,

for example, energy management and efficiency and air quality, to incorporate climate change related concerns in planning and policy making. This not only aids in the creation of knowledge about local possibilities and pitfalls for addressing climate change, but also generates “norms about the value of doing so” (Betsill & Bulkeley, 2004). That is, reducing GHG emissions becomes the responsible thing to do.

The change in climate debates in many local jurisdictions and private sectors from “should we do anything” to “what kind of action should we take” is critical for both the general belief that more pro-active climate change action is needed, and the appropriateness of specific policy choices. On many of these issues, climate networks promote norm generation and promulgation across public and private sectors. For example, changing norms on climate policy may affect renewable energy norms; if wind turbines come to be viewed as expected and normal parts of the landscape, proposals to cite them might induce less local resistance over time. Similarly, climate change action is intimately linked to issues of energy savings, which include energy uses, building codes, fuel standards, and the design of technical goods. On all these issues, normative changes could bring about significant changes for authorities, companies, and citizens.

### **The Shape of Things to Come**

Momentum in favor of more comprehensive U.S. climate change policy is growing in many municipalities and states, among civil society actors, and in the private sector. We have examined four pathways through which developing climate change action may shape future decisions and policy. There is little evidence that municipal, state, civil society, and private sector climate change related efforts will abate in the near future (Selin & VanDeveer, 2006). Rather, with deepening scientific consensus on anthropogenic influence on the global climate system and emerging understanding of adverse implications of a changing climate for different regions, it is reasonable to conclude that climate science and policy issues will grow in importance on the U.S. political agenda in the short and medium-term. This prediction builds on the strategic and normative commitments of many of those actors who are engaged in expanding climate change policy development.

Of course, any serious national climate policy will consist of many parts, as politicians and policy makers face the challenge of simultaneously addressing multiple interrelated issues in the face of competing interests and scientific, economic, and political uncertainty (Victor, 2004). Yet, close attention to developing climate change action in public and private sectors can yield important clues to future U.S. federal climate change policy. Given the U.S. tradition of environmental federalism with states pioneering policy developments, and the rapid expansion of climate change action and policy below the federal level, we predict the enactment of more stringent federal climate change policy that is modeled on existing sub-national and private sector efforts. In other words, those policies currently being enacted among states and municipalities, and those with the most active support of public, private, and civil society actors, are more likely than other policy ideas to be included in federal policy.

The policy developments and processes discussed above suggest that mandatory climate change emission regulation is likely to be enacted by 2010, in the 110<sup>th</sup> and/or 111<sup>th</sup> Congresses (assuming that no large scale event dramatically alters the Congressional and national agenda).<sup>18</sup> In other words, this timeframe for legislative and executive branch actions includes the Congress preceding, and that following, the 2008 federal elections. Like Victor (2004), we expect future U.S. federal climate change policy is set to combine regulatory measures with market-based instruments for GHG reductions reflecting dominating economic and political interests. That is, federal policy will consist of both command-and-control regulations and market-based incentives similar to those being developed in states, municipalities, and the private sector across the country.

Based on the analysis above, future federal U.S. climate policy is likely to include the following components:

1. A national cap on CO<sub>2</sub> emissions. Like those of many U.S. cities and states, this cap is likely to include an initial date for stabilizing emissions followed by a series of time-based targets for modest emissions reductions over time.
2. A national CO<sub>2</sub> cap-and-trade scheme partially modeled on existing regional and federal trading schemes for SO<sub>2</sub> and NO<sub>x</sub> and drawing on work conducted under RGGI. Like RGGI, a national CO<sub>2</sub> trading scheme is likely to focus initially only on the utilities sector and leave open the possibility of adding additional sectors.<sup>19</sup>
3. National, mandatory renewable energy portfolio standards. Like those renewable energy portfolio standards in many states, the national standard is likely to begin with quite modest goals and increase over time so as to gradually drive energy sector investments and technological developments.
4. Mandatory national product standards for increased energy efficiency. Such standards are likely to expand on existing federal and state energy saving programs and target large energy users including major heating and cooling systems, office equipment, and common household appliances.
5. Increased vehicle fleet gasoline efficiency standards (CAFE standards). While most states have avoided policy action aimed at transportation issues because of local resistance, the federal government is likely to retain its decade's old use of vehicle fleet standards and enact modest increases in these over time. Changes in CAFE standards are likely to incorporate aspects of vehicle emissions standards developed in California.
6. Increased use of federal monetary incentives. Such incentives are likely to include corporate tax credits for research and development and additional subsidies to consumers for the purchase of more energy efficient products including vehicles.

These predicted policies are consistent with existing federal environmental policy and/or climate change policies currently pioneered by states, municipalities, and firms. As public and private sector actors continue to develop climate change policy, pressure on federal policy makers and national political leaders are increas-

ing via the four pathways of influence: the technical and economic feasibilities of different policy options are demonstrated, markets for GHG reduction and less energy demanding goods are created and expanded, policy lessons are accrued and disseminated across jurisdictions, and norms regarding the appropriateness of climate change mitigation are established. It should also be noted that local public officials' and private sector groups' fears of imposing competitive disadvantages will likely constrain the stringency of their actions unless similar policies are adopted nationally (and internationally) (Betsill, 2001).

In predicting policy outcomes related to climate change, one can also identify available policy options that are not likely to be included in expanded federal policy, given current debates and existing initiatives. For example, taxes levied directly on GHG emissions, gasoline, and electricity consumption appear unlikely (at least in the short-term). As noted above, such taxes are little used in sub-national efforts and they have few supporters among climate policy advocates in the public or private sectors—despite the fact that many economic analyses suggest that such taxes are efficient to distribute costs of GHG reduction policies. For similar reasons, other policy options also appear to be unlikely choices for federal policy makers. These include significant increases in investments for public transportation systems and regulations aimed at reducing GHG emissions from land use changes and development patterns.

Of course, domestic and international spheres of climate change politics and policy making are closely intertwined. Thus, the development of much more ambitious federal climate policy would likely be a major driver of changing U.S. foreign policy on climate change mitigation (Victor, 2004). Citing Putnam's (1988) two-level game of linkages between international and domestic bargaining, Bang, Tjernshaugen, and Andresen (2005) argue that a U.S. re-engagement with international climate policy is dependent on a change "in the constellation of domestic stakeholders and politicians who represent the current majority" of climate policy skeptics in the United States. Similarly, if U.S. federal policy changes along the lines we envision, it is reasonable to expect U.S. foreign policy positions vis-à-vis international climate change politics will change toward more active engagement.

In other words, it is unlikely that that the U.S. will pursue a more proactive foreign policy on climate change until it has a more credible national policy. The United States tends to be unwilling to act internationally on environmental issues without first having taken corresponding domestic action (DeSombre, 2005). Thus, if more expansive climate change policy develops at the federal level, then U.S. foreign policy is likely to also be affected as coalitions of environmentalists, public officials, and private sector actors may push the U.S. government to upload aspects of domestic climate change policy to the global level. For example, DeSombre's work demonstrates that coalitions of civil society and private sector actors, "Baptists and bootleggers" as she calls them, have had important influence in the development of U.S. foreign environmental policy (DeSombre, 2000).

At the same time, international policy developments on climate change can also influence U.S. perceptions of national interests and policy options. In 2005 and 2006, for example, the entry into force of the Kyoto Protocol and the launching of a cooperative U.K.-California climate change effort highlighted climate change issues on the U.S. domestic agenda (Blood, 2006). In addition, many U.S. public,

private, and civil society actors are well connected with international experts and policy advocates through a host of professional networks, programs, and organizations. U.S. states have also looked at efforts and experiences in European countries to reduce GHG emissions as they have developed climate change action plans. The RGGI initiative moreover draws inspiration and design lessons from the European Union's cap-and-trade system, and RGGI participants are in frequent contact with European counterparts.<sup>20</sup>

In addition, many U.S. municipalities engage with foreign cities under ICLEI's CCP program. A growing number of U.S.-based companies also look to foreign companies and/or their foreign subsidiaries as they seek to reduce their GHG emissions and adjust their operations to a more carbon constrained economy. These different transnational connections between U.S. private sector actors and public sector actors at the sub-national level and non-U.S. actors and policy developments can be important for climate change debate and policy making in the United States and may contribute to changes in the domestic political constellations deemed necessary by Bang, Tjernshaugen, and Andresen (2005) for changing U.S. foreign policy in the area of climate change. Yet, we believe that domestic policy changes at the sub-national level—rather than intergovernmental policy events—will be most critical in re-shaping U.S. federal climate change policy.

### **Opponents of Climate Change Action and Policy**

The rather modest climate change regulations among U.S. states, cities, and companies to date are not going to significantly alter the amount of CO<sub>2</sub> in the atmosphere or, by themselves, prevent significant climactic changes in the 21<sup>st</sup> century. Only serious concerted long-term national and global policy efforts can begin to accomplish that. Many national and local policy makers and corporate leaders, however, continue to oppose mandatory GHG regulations. A few even continue to question the science behind human-induced climate change, while the larger groups of skeptics stress economic costs and risks of regulating CO<sub>2</sub> emissions.

Yet, economic arguments against mandatory climate change policy are coming under sustained scrutiny in California and in the Northeast, where state climate change action is most aggressive. In both areas, cost estimates for moderate GHG mitigation policies suggest that such policies either have rather modest costs or may actually produce aggregate economic benefits (largely the result of savings related to energy expenditures) (Hanemann & Farrell, 2006; Selin & VanDeveer, 2006). Such estimates, in conjunction with the many economic opportunities offered to firms by new GHG regulations, have divided private sectors actors' opposition to climate change policies and produced an increasingly vocal set of firms advocating for more stringent climate change action (Mouawad & Peters, 2006; Barringer, 2006).

Opponents of more aggressive climate policy have nonetheless taken notice of the growing number of climate change related policy development at state and municipal levels and in the private sector and begun to organize their opposition (Bourne, 2004). Opposition strategies include a host of political and legal measures, as evident in the legal challenges by the automotive industry to California's decision



to regulate CO<sub>2</sub> emissions from vehicles and the well-funded efforts to oppose expanded energy taxation in California under the “No on 87” campaign (<http://www.nooiltax.com>). The Competitive Enterprise Institute (<http://www.cei.org>) moreover recently launched an aggressive media campaign against efforts to control CO<sub>2</sub> emissions with the slogan “They call it pollution; we call it life”. In another major public relations effort, the coal industry seeks to counter criticism of coal as a “dirty” energy source (<http://www.learnaboutcoal.org>).

In addition, while some public and private sector actors have made notable progress in controlling their GHG emissions, others have achieved very little. For example, all New England states continue to struggle to meet their GHG reduction goals for 2010 and firms such as Ford and BP have found that meeting and sustaining their GHG reduction goals is considerable more difficult than setting them (Vogel, 2005). Furthermore, climate change policy proposals often die in state legislatures and city halls across the country. Although CCX membership and trading volumes are growing, the relatively low price for CO<sub>2</sub> indicates that the set cap is rather modest (Grant, 2005; Levy, 2005). Technical and political debates around many of the details of cap- and trade-schemes also remain contentious, including those associated with issues how to reliably measure and monitor offsets. In addition, many federal policy makers remain opposed to immediate mandatory GHG controls.

Nevertheless, we argue that the growing number of climate change leaders—and the political, legal, and practical actions they take—increasingly shape debates and policy making in the United States. Many public and private sector actors are considerably more active on climate change issues than they were only a few years ago. Growing policy momentum is building among public, private, and civil society sectors, affecting change through the four pathways outlined above, resulting in mounting pressure on federal law makers to act to combat climate change. This pressure from below, we argue, will soon shape federal policy making and outcomes along the lines we predict above. As the four pathways suggests, a combination of moral arguments (“it is the right thing to do”) and strategic arguments (“it is the economically sensible thing to do long-term”) is prying open a political window of opportunity for national policy change.

### **Concluding Remarks**

Policy prediction is notoriously difficult and fraught with uncertainty. U.S. climate change policy making, for example, is influenced by municipal and state level action, private sector developments, public opinion, federal politics, and international politics across a host of complex environmental, social, and economic issues. Yet, theories and instruments of political and policy analysis can be fruitfully used to produce informed predictions. Such analysis can clarify conditions under which U.S. public and private sector climate change policy is formulated, identify factors and forces shaping these policy developments, discern likely characteristics of future federal climate change policy, and shed light on possible implications of changing federal policy.

By late 2006, there was a wide range of climate change action and policy making rapidly developing in public, private, and civil society sectors in the United States.

This growth in sub-national and private sector climate change initiatives is driven by a multitude of networked actors who pioneer climate change initiatives ahead of federal requirements. More specifically, network participants channel influence through four overlapping pathways: (1) the strategic demonstration of the feasibility of climate change action; (2) the creation and expansion of markets; (3) policy diffusion and learning; and (4) the creation and promulgation of norms about the need for more aggressive climate change action. Combined, these pathways promote both moral and strategic reasons for policy change.

To date, the U.S. government has engaged in few efforts to reduce GHG emissions, and national emissions continue to increase. Thus, in the short and medium term, expanding sub-national policy and programs are likely to prove more important politically than environmentally significant. By assessing what policy ideas are influencing sub-national and private sector actors in their attempts to address climate change, one can see which of the many available policy options are gaining support in the public and private spheres. Those policies currently being enacted, implemented, and assessed by major public and private sector entities have identifiable political constituencies. As such, they are most likely to influence future federal policy development through different combinations of the four pathways of change identified earlier.

Based on our analysis of policy change below the federal level, we predict that future federal U.S. climate policy will include six major components: (1) A national cap on GHG emissions; (2) A national market based cap-and-trade GHG emissions trading scheme; (3) Mandatory renewable energy portfolio standards; (4) Increased national product standards for energy efficiency; (5) Increased vehicle fleet energy efficiency standards; and (6) Increased federal incentives for research and development on energy efficiency issues and renewable energy development. These policies are already being implemented in the public and private sectors, and have identifiable constituencies of well-networked actors. As such, they are likely to be part of future federal policy. Conversely, policy ideas with fewer and/or less powerful political advocates are less likely to be included in federal policy.

Because the United States has often been reluctant to engage in internationally environmental policy making and accept international environmental regulations before corresponding domestic action has been taken (particularly in the context of a highly contentious domestic issue such as climate change), developments in federal climate policy can be expected to induce changes in U.S. foreign policy. This means that significant changes in U.S. foreign policies related climate change are likely only after the enactment of more expansive federal climate change policy. As such, observers and policy makers from both inside and outside the United States would be wise to closely study ongoing and dynamic public, private, and civil society sector climate change developments outside Washington D.C., and their influence on national debates and future federal policy making.

## **Notes**

- 1 Our predictions combine elements of Dunn's (2004) notion of projection (forecasts based on extrapolations from trends) and prediction (forecasts driven by theoretical assumptions).

- 2 Such claims were also made by many participants at the conference Global Warming Solutions 2005, New York City, June 8–9, 2005.
- 3 Tackling U.S. GHG emissions is important to bring down global emissions. The United States is the world's largest GHG emitter with approximately one-fourth of global emissions. Between 1990 and 2003, U.S. emissions grew by 13% (U.S. Environmental Protection Agency, 2005).
- 4 The consensus among the Senators who voted in favour of the Byrd-Hagel resolution should not be overstated, however, as Senators voted for the resolution for different reasons and different views were expressed during the debate and vote.
- 5 In a cap-and-trade scheme, a cap of the total amount of emissions that regulated sources can emit is set. Emitters are then assigned allowances equal in number to the size of the cap, which can be freely traded among participants. Emissions trading schemes (or markets) offer opportunities to maximize both emissions reduction and cost efficiency.
- 6 See also the Pew Center's database of state and local climate change initiatives at <http://www.pewclimate.org>.
- 7 Other states with GHG reduction targets include Maine, Massachusetts, New Hampshire, New York, and New Mexico.
- 8 For more on the US Mayors Climate Protection Agreement, see <http://www.seattle.gov/mayor/climate>.
- 9 Polling data are taken from the Roper Center: <http://ropercenter.uconn.edu>.
- 10 These data can be found at the U.S. Environmental Protection Agency web site: <http://yosemite.epa.gov/oar/globalwarming.nsf/content/emissionsindividual.html>.
- 11 This network includes state Public Interest Research Groups (PIRGs), state chapters of Clean Water Action and Sierra Club, dozens of local environmental groups, and relatively new organizations focused on climate change such as Clean Air - Cool Planet and Environment Northeast.
- 12 See also <http://www.newenglandclimate.org>.
- 13 For more on The Climate Group, including its guiding principles and membership, see <http://www.theclimategroup.org>.
- 14 See, for example, the activities and publications of the Environmental Markets Association at <http://www.emissions.org>.
- 15 Offsets occur when one actor pays another to reduce GHG emissions on their behalf.
- 16 Authors' notes, 2003 Annual Meeting of the New England Governors and Eastern Canadian Premiers, Groton, CT.
- 17 See, for example, the publications and websites of organizations such as Clean Air, Cool Planet at <http://www.cleanair-coolplanet.org> and The Climate Group at <http://www.theclimategroup.org>. Similar efforts to catalogue success stories are supported by the U.S. Environmental Protection Agency and the Pew Center on Climate Change.
- 18 By high profile, agenda altering events, we mean something on the order of the 1998 impeachment processes, a high profile terrorist attack, or another imminent threat to national security.
- 19 An American emissions trading scheme may also draw lessons from foreign schemes, including the one developed in the European Union.
- 20 Authors' interviews with RGGI participants, 2004–2006.

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