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The Global Energy Market:
Comprehensive Strategies to Meet
Geopolitical and Financial Risks

U.S. Foreign Policy and Climate Change

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THE GLOBAL ENERGY MARKET:

COMPREHENSIVE STRATEGIES TO MEET GEOPOLITICAL AND FINANCIAL RISKS

THE G8, ENERGY SECURITY, AND GLOBAL CLIMATE ISSUES

PREPARED IN CONJUNCTION WITH AN ENERGY STUDY SPONSORED BY
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ABOUT THE GLOBAL ENERGY MARKET STUDY

The Global Energy Market: Comprehensive Strategies to Meet Geopolitical and Financial Risks—The G8, Energy Security, and Global Climate Issues examines a variety of scenarios for the future of global energy markets. Some of these scenarios evaluate factors that could trigger a regional or worldwide energy crisis. The study assesses the geopolitical risks currently facing international energy markets and the global financial system. It also investigates the consequences that such risks could pose to energy security, pricing, and supply, as well as to the transparent and smooth operation of the global market for oil and natural gas trade and investment. By analyzing these threats in depth, the study identifies a series of policy frameworks that can be used to fortify the current market system and ensure that it can respond flexibly to the array of threats that might be encountered in the coming years. The study also looks at the impact of emerging climate policy on the future of world energy markets.

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U.S. FOREIGN POLICY AND CLIMATE CHANGE

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I. SUMMARY

Climate change has to date played a modest part in U.S. foreign policy. During the administration of President George W. Bush, the U.S. position on international climate change policy has been largely obstructionist, as the United States withdrew from the Kyoto Protocol process and, at the 2007 United Nations Conference on Climate Change, vetoed post-Kyoto mandatory emission limits for developed countries. The position of the Bush administration has prompted a number of states and localities -- most notably California -- to move forward with their own programs to reduce greenhouse gas (GHG) emissions.

Climate change has had limited salience in American national politics to date. This appears to be changing as Congress considers new climate change legislation and presidential candidates of both major parties feature climate change policy in their campaigns.

Whoever wins in November 2008, the next American administration is unlikely to be as negative as its predecessor towards international action on climate change. This may still fall short of formal U.S. participation in an international system of cap and

trade. Instead, in the short-term, one may see what could be called "convergence," as the United States implements policies roughly consistent with international efforts.

While there is important scope for gathering "low hanging fruit" -- i.e., fostering energy efficiency -- some carbon pricing will clearly be part of any concerted national effort to reduce the growth of GHG emissions. This can take the form of a carbon tax, a cap-and-trade system, or some mix of both.

II. INTRODUCTION

This paper addresses a few key subjects: the history of U.S. climate change policy; the role of climate change in international relations; the implications of the 2008 U.S. presidential election on future climate change policy for the United States and in the international arena; and the possible future pathways for U.S. engagement in international climate change policy.

Given the complexity and contentiousness of global climate change, it is important to stress this paper's limits. Above all, the authors are not embarking on an assessment of the scientific evidence about climate change. In specific, the authors will accept the most recent findings of the Intergovernmental Panel on Climate Change (IPCC) -- as embodied in the IPCC's synthesis report of November 2007, which consolidates the key findings of earlier IPCC working group reports.[1] The authors are acutely aware that the findings of the IPCC are not immutable. But we do believe that the findings offer the best science available.

Pursuant to the IPCC findings, the authors also assume: (a) that some international response to the problem of climate change is necessary; and (b) that the

[1] The synthesis report, working group reports, and indeed all IPCC publications may be found at www.ipcc.ch

success of any such response will hinge -- given the American position as the world's largest GHG emitter -- upon U.S. cooperation, whether formal or informal.

While the paper will occasionally touch upon economics by necessity, much of the discussion will focus on the politics -- domestic and international -- of the issue. On the international level, addressing climate change is a daunting proposition. It is perhaps the most difficult collective action problem in the history of international relations, one made intractable by its global scope, its differential impact upon various countries, and the multigenerational scale of both the problem and any plausible solution.

In sum, addressing global climate change is, in large part, a political problem. At the supranational level, it will require the cooperation of major GHG emitters, a group of economies as varied as the United States, the European Union (E.U.), Russia, and China. At the national level, it will demand broad-based political decisions robust enough to endure several decades. In strongly federal systems like the U.S., the political picture is even more complicated, as states and localities are moving forward with their own policies to address climate change in the absence of significant federal movement under the administration of George W. Bush.

III. A HISTORY OF U.S. CLIMATE CHANGE POLICY

The United States holds an important and ambiguous position in the international debate over global climate change. As the world's largest consumer of hydrocarbons, the U.S. necessarily must play a vital part in any effort to reduce GHG emissions. American physical scientists have been at the forefront of the emerging consensus on the human role in climate change.[2] Numerous U.S. cities and states have embarked on initiatives to

[2] An American scientist, Stephan Schneider, was an important voice in raising academic and public awareness of the risk associated with greenhouse gases during the 1970s and 1980s.

reduce GHG emissions.[3] The world's most famous spokesman on the threat of global climate change currently is an American -- former Vice President and 2007 Nobel Peace Prize Laureate Al Gore.[4] Yet the United States has never ratified the Kyoto Protocol, the centerpiece of international efforts to curb GHG emissions. The administration of George W. Bush -- despite some recent unbending -- has been hostile both to the protocol and any successor to it that includes mandatory caps on emissions without including major developing countries, such as China and India. In April, 2008, Bush announced his support for halting the growth of U.S. greenhouse gas emissions by 2025. However, he stopped short of endorsing the regulatory proposals being discussed in Congress and by the presidential campaigns of senators Clinton, Obama, and McCain.

Official U.S. involvement in international efforts to curb greenhouse gas emissions dates to the United Nations (U.N.) Framework Convention on Climate Change (UNFCCC). This treaty was produced at the 1992 U.N. Conference on Environment and Development (UNCED) -- "The Earth Summit" -- held in Rio de Janeiro. The UNFCCC, in turn, was driven in large part by the findings of the IPCC. The IPCC was established in 1988 by two U.N. bodies, the World Meteorological Organization and the United Nations Environment Programme (UNEP), because of growing international concern over a possible long-term rise in global temperatures.

The UNFCCC was precisely what its name suggested: a framework for further discussion, negotiation, and agreement. Its stated objective is "to achieve stabilization of greenhouse gas concentrations in the atmosphere at a low enough level to prevent

[3] See section V of this paper for a fuller description.
[4] Gore shared the 2007 prize with the Intergovernmental Panel on Climate Change.

dangerous anthropogenic interference with the climate system."[5] While the UNFCCC permitted additions -- called "protocols" -- that would set mandatory emissions limits, the treaty set no such standards itself and contained no enforcement mechanisms.[6] It did, however, call for industrialized nations to stabilize GHG emissions at 1990 levels by 2000. [7] And it did bind signatories to prepare national GHG emission inventories. The United States, under President George H.W. Bush, played an active, if grudging, part in negotiating the framework, weakening a number of its provisions.

On June 12, 1992, 154 countries -- including the United States -- signed the UNFCCC. President Bush sent the convention to the Senate on September 8 of that year, with it being ratified a little over a month later on October 13, 1992. Other countries acted similarly. The UNFCCC entered into force on March 24, 1994.

Then followed a series of annual meetings -- or "conference of parties" -- aimed at more specific measures to reduce GHG emissions. They are named after the cities where they were held: Berlin, Germany (1995); Geneva, Switzerland (1996); Kyoto, Japan (1997); Buenos Aires, Argentina (1998); Bonn, Germany (1999); The Hague, Netherlands (2000, resumed in Bonn, Germany early in 2001); Marrakech, Morocco (2001); New Delhi, India (2002); Milan, Italy (2003); Buenos Aires, Argentina (2004); Montreal, Canada (2005); Nairobi, Kenya (2006); and Bali, Indonesia (2007).[8]

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[5] United Nations Framework Convention on Climate Change, 1992. Its full text is available at www.unfccc.int.

[6] The international approach clearly paralleled the earlier effort to limit chlorofluorocarbons (CFCs) in the atmosphere, first through a general agreement – the 1985 Vienna Convention for the Protection of the Ozone Layer – then a more specific, binding protocol – the Montreal Protocol on Substances that Deplete the Ozone Layer, which was negotiated in 1987 and entered into force in 1989.

[7] "Annex I" countries, so-called because they appear in annex one of the convention; emission limits for USCFCC Annex I countries are found, somewhat confusingly, in Annex B of the Kyoto Protocol to the Convention.

[8] See: http://unfccc.int/meetings/archive/items/2749.php

Of these meetings, the most important to date has been the one held in Kyoto, where negotiations led to the protocol that bears the city's name. The protocol is a complex document that reflects the compromises necessary to achieve consensus during sometimes arduous talks. Key elements of the Kyoto Protocol include: the concept of common but differentiated responsibility, which places national caps on emissions for developed countries but not less-developed ones; financial support for efforts by developing countries for projects and studies aimed at mitigating GHG emissions; a system of emission trading, including the provision for special carbon credits for developing countries under the Clean Development Mechanism (CDM); and enforcement mechanisms that include penalties for non-compliance. The protocol entered into force on February 16, 2005. By mid-2007, roughly 170 countries had ratified the protocol. It is set to expire in 2012.[9]

The United States, under the Clinton administration, took an extremely active part in the negotiations leading to the protocol. In contrast to his predecessor, President Bill Clinton placed a premium on environmental policy. Nonetheless, the United States frequently found itself at odds with the E.U. over the scope and speed of reducing GHG emissions. One observer has called the Clinton administration "confused and inconsistent" in its approach to the protocol.[10] Though the United States signed the protocol in 1998, the Clinton administration clearly harbored doubts about it -- not least because of overwhelming U.S. congressional opposition to many of its provisions. This opposition was made manifest when the Senate unanimously passed a resolution stating

[9] The text of the protocol may be found at unfccc.int. A good brief discussion of its provisions may be found in Joseph E. Aldy and Robert N. Stavins, eds. *Architectures for Agreement: Addressing Global Climate Change in the post-Kyoto World* (New York: Cambridge University Press, 2007), 8-13.
[10] Andrew L. Dessler and Edward A. Parson, *The Science and Politics of Global Climate Change* (New York: Cambridge University Press, 2006), 15.

that the United States would not be party to any agreement that did not include emissions targets for developing countries or which did serious harm to the U.S. economy.[11] Fearing certain rejection, the Clinton administration never submitted the Kyoto Protocol to the Senate for ratification. The administration hoped, perhaps unrealistically, that subsequent international negotiations would permit changes to the protocol that would make ratification possible.

Global warming played a modest role in the 2000 presidential campaign.[12] Then-Vice President Al Gore, the Democratic candidate, found himself in the unenviable position of running against the Republican candidate, Texas Governor George W. Bush, and independent candidate Ralph Nader, who routinely assailed both candidates for being weak on environmental issues. While campaigning for the presidency, Bush was clear in his rejection of the Kyoto Protocol and his doubts about the science behind global climate change. He did, however, at one point propose mandatory carbon caps on electrical power utilities, a position he repudiated when he assumed office. What would have happened if Vice President Gore had been elected is speculative. However, he might well have pushed for measures that would have placed the United States in closer compliance with Kyoto limits, if still not submitting the protocol itself for likely defeat in the Senate.

Global climate change played a very similar role in the 2004 presidential election. The Democratic nominee, Senator John Kerry of Massachusetts, had a long history of environmental advocacy both in government and out of it.[13] In the campaign, Senator

[11] The Byrd-Hagel Resolution was passed on July 25, 1997, while negotiations on the Kyoto Protocol were still ongoing. The vote was 95-0.

[12] In a presidential election as close as 2000 it is hard -- if not impossible -- to tell how important any given issue was to the outcome.

[13] He did, however, vote for the Byrd-Hagel Resolution. Like a number of senators who voted for the resolution -- including one of its co-sponsors, Republican Chuck Hagel of Nebraska -- Kerry stressed that his vote on the resolution was not to pull out of the Kyoto process but to alter the course of its negotiations.

Kerry attempted to draw a clear contrast between himself and President Bush on environmental issues, including global climate change. His campaign stressed the importance of American international leadership in addressing the issue. The Bush campaign, in contrast, highlighted the danger Kyoto posed in terms of lower growth and diminished employment. But climate change did not loom large in the campaign, which was driven by other issues.

If the Clinton administration was ambiguous towards the Kyoto Protocol, the successor administration of President George W. Bush has been hostile. While eventually supporting the general principle of stabilizing GHG, the Bush administration opposed ratification of the protocol on a number of grounds. These included: the exemptions granted to developing countries, notably China, the world's second-largest producer of carbon dioxide; the damage that mandatory emission limits would cause to U.S. and world growth; and, not least, the uncertainties surrounding the science of global climate change. The last has become a highly politicized subject in the first decade of the 21st Century. Liberals and Democrats, by and large, have supported the growing scientific consensus on anthropogenic climate change; conservatives and Republicans have generally thrown in their intellectual lot with so-called climate change skeptics.[14] The Bush administration came under frequent and sharp criticism for exerting pressure on government scientists to avoid the subject of global climate change or to weaken their findings.[15]

[14] Republican Senator James Inhofe of Oklahoma has derided global climate change as a "hoax." He famously summoned novelist Michael Crichton, a fellow skeptic, to testify before the U.S. Senate's Committee on Environment and Public Works. "Michael Crichton, Novelist, Becomes Senate Witness," *The New York Times*, September 29, 2005.

[15] This is a part of a broader critic of what observers believe to be the Bush Administration's politicization of science from abortion to anti-missile defense. See Chris Mooney, *The Republican War on Science* (New York: Basic Books, 2005).

In 2002, the United States withdrew from the Kyoto Protocol process. U.S. representatives would thereafter attend meetings but largely participated as observers. The same year, President Bush announced his administration's alternative to the protocol. His proposals included expanded federal investment in new low-carbon technologies, programs to promote voluntary reductions by businesses, and cooperation with major developing countries in their efforts to reduce GHG emissions.[16] The president also pledged to reduce national GHG intensity by 18 percent by 2012. The last measure was dismissed by many critics. Given expected U.S. growth rates, the projected reduction in GHG intensity—essentially the amount of GHG emitted per dollar of U.S. gross domestic product (GDP)—will still lead to a 12 percent increase in absolute GHG emissions.[17] Moreover, the United States was already experiencing a decline in GHG intensity related to a shift from manufacturing to service industries; it was far from clear that the president's goal was meaningful in any way. Even the Bush administration's commitment to research and development—perhaps U.S. $18 billion since assuming office—is modest by the standards of the U.S. federal government, which has spent well over U.S. $6 trillion during the period in question; the effort surely falls short of any crash "Manhattan Project."

While the Bush administration's posture has softened somewhat towards the science of global climate change, its overall approach to the issue has remained consistent. Key elements include a rejection of any mandatory limits without developing country participation and an emphasis upon investment in clean coal and other technologies. Indeed, this stress upon the role of technology has been a consistent theme

[16] "President Bush Discusses Global Climate Change," June 11, 2001. Available at www.whitehouse.gov.
[17] Dessler and Parson, 129.

of the administration's approach. A month after the December 2007 Bali Conference, President Bush's top environmental advisor, James Connaughton, declared that, "Lowering the cost of emissions reductions requires speeding up the development and deployment of technologies that will fundamentally improve the way we produce and consume energy."[18]

The United States has sought to pursue its goals outside of the formal Kyoto process. The administration of George W. Bush was a driving force behind the creation of the Asia-Pacific Partnership on Clean Development and Climate, a group that—like its leading members, the U.S., India, China and Australia—has rejected mandatory limits.[19] Western Europeans were unable to get the American administration to alter its position on mandatory limits at a G-8 meeting in Germany in June 2007, instead having to settle for as-yet unspecified and unenforceable long-term goals. In September 2007, the Bush administration convened a special meeting of major economies on energy security and climate change. While calling for the development of GHG emission goals, the president's message—in its refusal to accept mandatory limits—remained unaltered.[20] Indeed, considering President Bush's call for joint -- if voluntary -- action by major economies, he seemed to signal continued U.S. resistance to tackling global climate change within the U.N.-centered Kyoto process.

The much-heralded December 2007 U.N. Conference on Climate Change in Bali, Indonesia, yielded at best ambiguous results. The assembled countries did agree to a "Bali Roadmap" that, in principle, could lead to a new protocol governing GHG

[18] James Connaughton, and Daniel M. Price, "The Bush Plan for Climate Change," *Wall Street Journal*, January 26-27, 2008.
[19] Australia's position changed after the election of Kevin Rudd as Prime Minister. See below.
[20] "President Bush Participates in Major Economies Meeting on Energy Security and Climate Change," September 28, 2007. Available on www.whitehouse.gov.

emissions following the end of the Kyoto Protocol in 2012. They also focused on ways to reduce emissions by curtailing deforestation, perhaps through carbon credits, though the details remain to be worked out. China, in a break from the past, agreed to language in the roadmap that pledges it and other developing countries to *consider* "measurable, reportable, and verifiable" mitigation efforts—though the pledge, of course, did not include any specific targets.[21] The United States, joining Russia, Japan, and Canada, turned back an E.U. effort to set such targets for emissions cuts by industrialized countries. The conference was, in many ways, a humiliation for the United States. Former Vice President Al Gore, who attended the conference, assailed his own country for its obstructionism.[22] The chief U.S. representative was actually booed when she rose to speak. One thing was clear, however: the Bush administration was pushing any major decisions on a post-Kyoto process, specifically emission targets, to its successor.

IV. THE ROLE OF CLIMATE CHANGE IN INTERNATIONAL RELATIONS

As shown by the huge international media interest in the Bali Conference, climate change is an increasingly important subject in international relations. Whether it has yet reached the ranks of what could be called first-order foreign policy issues, such as terrorism, the war in Iraq, non-proliferation, E.U. expansion, or global economic growth, is another question. It most assuredly has not yet become a decisive foreign policy subject in the United States, though this may be in large part an artifact of the relatively low priority assigned it by the Bush administration. That said, climate change—whoever wins the American presidency in 2008—will surely loom larger in international affairs during the years and decades to come. This is particularly true as major greenhouse gas

[21] Fred Pearce, "Roadmap to Where?" *The New Scientist*, December 22, 2007.
[22] Thomas Fuller and Elisabeth Rosenthal, "At Divided Climate Talks, Consensus that U.S. Is at Fault," *The New York Times*, December 14, 2007.

emitting countries ("major economies") struggle to forge a post-Kyoto system of emission targets and other mitigation measures.

Many of the international differences over the appropriate approach to climate change simply reflect variant levels of development, economic carbon intensity, and endowment of natural resources. China and other developing countries, for instance, clearly see mandatory emission targets as a potentially formidable barrier to raising living standards for relatively impoverished populations. Major hydrocarbon exporters such as Russia are similarly wary.[23] Countries like Japan, already relatively energy efficient, worry that mandatory targets will put them at a disadvantage compared to inefficient ones, as the latter cut emissions through relatively easy and cheap measures no longer available to Japan. The United States—the world's largest consumer of hydrocarbons and, perhaps more importantly, boasting per capita carbon dioxide emissions roughly twice that of the E.U. or Japan—is unsurprisingly greatly concerned about the economic costs of GHG mitigation efforts.

Yet more than simple national interest is at stake. Domestic politics play a part as well. For example, Australia's official attitude towards climate change underwent a turnabout with the election of Labor Prime Minister Kevin Rudd in late 2007.[24] The

[23] Russia was essentially bribed into signing the Kyoto Protocol by setting a baseline already 40 percent below its emission levels at the time of the protocol, opening up the prospect that Russia could reap potentially tens of billions of dollars under an international cap-and-trade system. See David Victor, *Climate Change: Debating America's Policy Options* (Washington, DC: Council on Foreign Relations /Brookings Institution, Press, 2004), 4. The whole issue of baselines is itself both controversial and complex.

[24] Kevin Rudd defeated the incumbent premier, John Howard, a major ally of President Bush, as well as an opponent of the Kyoto Protocol. Upon taking office, Rudd acted swiftly to bring Australia into the Kyoto framework. As a result, the United States became the only industrialized country not to publicly support the Kyoto Protocol. Prime Minister Rudd announced that his government will (a) set a target to reduce emissions by 60 per cent on 2000 levels by 2050; (b) establish a national emissions trading scheme by 2010; and (c) set a 20 percent target for renewable energy by 2020 to dramatically expand the use of renewable energy sources such as solar and wind.. See "Ratifying the Kyoto Protocol," Media Statement, Australian Labor Party, December 3, 2007. http://www.alp.org.au/media/1207/mspm030.php

political power of European environmentalists, either through "Green" or traditional parties, has clearly helped shape the European Union's forward-leaning international stance on climate change. In the United States, a different president in the White House from 2001 to 2009 would surely have altered the American position on the Kyoto process, though not, perhaps, as dramatically as some might think. It is difficult to imagine any U.S. Senate ratifying the protocol without mandatory limits for countries such as China.

Another element plays into the international equation on global climate change. This is public and governmental attitude, not just towards climate change itself but towards the sort of intrusive, supranational regime that will be required to address it. At one level, the European Union's embrace of the Kyoto process may reflect in large part the group's long experience and relative comfort with regulatory regimes crafted on an international basis. Absent the European Union's unique history, other countries are more wary of international commitments that severely constrain domestic environmental and economic policies.

Moreover, European debates have stressed not only potential economic costs and benefits of climate change mitigation, but also theories of global socio-economic equity and moral responsibility for historic emissions. For instance, "One of the core principles of German environmental policy is the precautionary principle."[25] In contrast, the discussion in American policy circles has most frequently coalesced around the economic costs and benefits of particular policies. In U.S. discourse, arguments which underline global inequities shaped by climate change or accountability for past carbon dioxide

[25] Loren R. Cass, *The Failures of American and European Climate Change Policy: International Norms, Domestic Politics, and Unachievable Commitments* (Albany: State University of New York, 2006) 16.

emissions have received less prominence.[26] It bears noting that this difference in approach predates the advent of the Bush administration; it was evident already in the sometimes heated disagreements between the Clinton administration and the E.U. in the lead up to Kyoto.

Given these varied interests, politics, and attitudes, any approach to addressing global climate change will be, by necessity, complicated. It is easy to imagine a system that would include explicit emissions targets for developed countries, including the United States; some international cap-and-trade system; a phase-in, perhaps based on per capita GDP, for less developed countries; some provision for technology transfer and perhaps direct assistance to these countries; and additional focus on adaptation, i.e., taking measures to offset the effects of climate change by, for instance taking steps to protect low-lying coastal areas. While this broad outline of measures—essentially Kyoto plus—is perhaps the most plausible of successful outcomes (though by no means the only one),[27] it still remains a daunting prospect.

As noted in the introduction, climate change presents a particularly acute collective action problem. There are powerful incentives for individual countries to "free ride," i.e., leave GHG mitigation to others, while they reap the immediate economic advantage of non-compliance. A concern about "free riding," specifically by China, was and is an important element in the U.S. Senate's opposition to the Kyoto Protocol, even among those otherwise inclined towards the agreement. If the "free riders" are important sources of emissions (and both China and India are), then they can undermine the entire

[26] Cass, 222; Mark Lacy, *Security and Climate Change: International Relations and the Limits of Realism* (London: Routledge, 2005), 24, 86.
[27] For perhaps the best discussion of various regimes of mitigation, see *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World*.

system. While other successful international efforts – the Montreal Protocol on protecting the ozone layer, the World Trade Organization (WTO), and even the North Atlantic Treaty Organization – may provide some guidance on how to proceed, none compare in complexity to crafting a successful regime to address climate change.

It is important to note how crippling the hostility of the Bush administration has been to the Kyoto process. This transcends the American veto of mandatory targets at Bali. Among industrialized countries, the United States under the Bush administration has become increasingly isolated in international climate policy affairs, because of its steadfast antagonism to the Kyoto Protocol. By rejecting that treaty, "President Bush faced near universal condemnation of America's climate policy."[28] Moreover, the U.S. position has also granted international "cover" to countries—such as Russia, Japan, and Canada—that share U.S. concerns. Ironically, U.S. intransigence has also deflected international attention from the opposition of developing countries like China to agree to mandatory targets and the very mixed record of the European Union on meeting its own emission targets.

Some sort of consensus among the United States, the European Union, and China will be key to forging an effective post-Kyoto climate change regime. This is not to diminish the importance of countries such as Japan, Russia, India, Brazil, or Canada. But a common Washington-Brussels-Beijing approach would clearly possess huge economic and diplomatic heft in any international negotiations. The three would not only represent a lion's share of the world's GHG emissions. They would also represent over half of world GDP and a vast store of international influence.

[28] Cass, 214.

Achieving such an agreement—even with a change in Washington's attitude—will be difficult. China, in particular, has sharply divergent interests from the United States and the E.U. Despite China's spectacular economic growth in recent years, it remains poor in comparison with the advanced economies of North America and Western Europe. Beijing sees robust economic growth not just as a means to raise living standards but also to bolster regime legitimacy. Agreements on emissions that might constrain China's economic growth are therefore viewed with great suspicion. This is particularly true because of the composition of China's energy mix: coal dominates its electricity sector and the country is rapidly becoming a major consumer of oil. Despite planned increases in hydroelectric power, China's growth will be fueled largely by hydrocarbons for the foreseeable future. Like many countries in relatively early stages of economic development, China has, until very recently, placed a very modest emphasis on environmental protection.

China's government acknowledges the reality of global climate change and its potentially negative effects on the earth's human population. But Beijing has steadfastly refused to agree to internationally negotiated targets on its emissions. China asserts that developed countries should accept their historical responsibility for current high concentrations of GHG in the atmosphere; less developed countries, for their part, should set their own reduction targets.[29]

In the medium- to longer-term, the world may see a shift in Beijing's position. Public concern with pollution is on the rise in China, particularly in urban areas. A 2007 poll found that 88 percent of Chinese were concerned about global climate change and a

[29] "China: Developing Nations Should Set Own Emissions Reduction Targets," *Xinhua News Agency*, November 22, 1997.

surprising 62 percent believe it appropriate for developed countries to demand restrictions on carbon emissions from China.[30] When Chinese public concern will be reflected in substantive Chinese policy on climate change is on open question. But, as China grows wealthier, one can expect a higher emphasis on environmental goods, including long-term ones like averting global climate change.

What of the United States? Looking forward, it is difficult to imagine any plausible U.S. administration following its predecessor's lead in obstructionism. But this does not mean that the United States will necessarily take a leadership role in crafting a post-Kyoto international regime, at least not formally. The reluctance of developing countries like China to agree to mandatory emissions will continue to make future ratification of any future agreement problematic on political grounds.

What may develop, however, is what could be called "convergence," as the U.S. implements policies (notably a cap-and-trade system) roughly compatible with the broader international effort. This is not without its problems. By not joining in an international cap-and-trade regime, American emitters will not, presumably, be able to buy credits abroad. This both lowers the incentives to countries like China to participate and raises the costs to U.S. emitters. This problem, in turn, is related to leakage: the risk that high GHG-emitting production will simply shift to countries like China -- a process that will be accelerated if U.S. emitters cannot simply buy international carbon credits. Some have recommended a carbon tariff to address this problem. Whatever such a tariff's theoretical merits, it is a very blunt instrument indeed. Even assuming that it is WTO compliant, such a tariff -- unilaterally imposed -- could prompt retaliation. Indeed, it is important to note that China holds well over a trillion dollars in U.S. sovereign debt.

[30] "2007 World Environmental Review." GMI. www.gmi.mr.com.

Moreover, should the United States embrace such a tariff, it runs the risk that more GHG efficient economies -- like the European Union -- could justifiably impose it upon U.S. products. A tariff is clearly a second best solution, if that.

V. U.S. DOMESTIC POLITICS:

IMPLICATIONS FOR U.S. FOREIGN POLICY & CLIMATE CHANGE

In a paper on global climate change policy, it must be briefly stated why a discussion of U.S. domestic policy and presidential politics is appropriate. To be sure, even a comprehensive, domestic climate change initiative by the United States to limit emissions will not be effective by itself. "Global climate change is the ultimate global-commons problem, with the relevant greenhouse gases mixing uniformly in the upper atmosphere, so that damages are independent of the location of emissions. Because of this, a multinational response is required."[31] Yet, the history of climate change negotiations shows that domestic politics are often *the* decisive force shaping U.S. climate policy.

Change in U.S. climate policy must come from within. Short of punitive measures, such as trade penalties, international pressure to regulate carbon is not likely to be the most important factor influencing U.S. policy. What would assuredly change U.S. policy, though, is a reconfiguration of domestic politics inside the United States. After all, "Practical, political considerations -- essentially domestic political interests -- will dictate the actions countries are willing to undertake" and "domestic legislative support

[31] *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World*, 1.

must precede executive consent."[32] The election of a new U.S. president in 2008 could reshape American climate change policy both at home and abroad.

With the 2008 U.S. presidential election campaign nearing its apex, the Democratic and Republican candidates have staked out clear and often detailed positions on global climate change. Candidates' positions have, in turn, been shaped by a relative lack of federal leadership on one hand, and strong state, regional, and local initiatives on the other. Since 2001, states and localities, as well as civil society organizations and businesses, have set the agenda for debate about climate change policy. Congress has only recently joined the fray in a serious way. Greater public awareness and concern about climate change has driven much of this newfound activism.

Measures taken by these sub-national actors, in fact, mitigate a common view overseas of the United States as being unconcerned and unmoved by the potential problems posed by climate change.[33] These stakeholders, whether acting independently or in concert, have managed to exert considerable, if not defining, pressure upon the U.S. Congress to pass legislation to reduce and restrict carbon emissions. Meanwhile, multilateral consultations led by the United Nations have slowly begun to chart a way forward for the nations of the world. Unless the George W. Bush administration unexpectedly reaches agreement on mandatory emissions limits with developing countries before leaving office, the administration's voice and influence on the issue will continue to be overshadowed by the 2008 presidential campaign and its outcome, as well

[32] *Architectures for Agreement*, 355; Bryan K. Mignone, "International Cooperation in a Post-Kyoto World," *Current History*, November 2007, 365.
[33] John Byrne, et al, "American Policy Conflict in the Greenhouse: Divergent Trends in Federal, Regional, State, and Local Green Energy and Climate Change," *Energy Policy* 35 (2007): 4555-4573.

as by pending Congressional legislation, state and local measures, and international developments.

The Impact of Recent Scientific Evidence

As the scientific evidence in favor of anthropogenic climate change has increased, growing numbers of Americans have come to view climate change as an important environmental and public policy concern. This broader awareness has, in turn, prompted many politicians to develop policy statements and action plans to address climate change. In essence, the climate change policy agenda has shifted from a debate over science to a discussion about how to respond. The 4th IPCC Assessment Report on Climate Change (The Physical Science Basis) released by the United Nations in February 2007 reiterated that climate change is occurring and that the burning of fossil fuels for energy is the primary cause:

> The global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 ppm [parts per million] to 379 ppm in 2005 […] the primary source of the increased atmospheric concentration of carbon dioxide since the pre-industrial period results from fossil fuel use, with land use change providing another significant but smaller contribution […] 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.[34]

[34] Inter-governmental Panel on Climate Change, *Fourth Assessment Report*. "Contribution of Working Group I to the Fourth Assessment Report of the Inter-governmental Panel on Climate Change: [The Physical Science Basis] Summary for Policymakers." New York: United Nations, 2007: 2 and 5.

The IPCC's science summary adds that "most of the observed increase in globally averaged temperatures since the mid-20th Century is *very likely* [at least 90 percent certainty] due to the observed increase in anthropogenic greenhouse gas concentrations."[35] In addition, the U.N. Human Development Report released by the U.N. Development Programme in November 2007 took pains to note that:

> Climate change is the defining human development challenge of the 21st Century. Failure to respond to that challenge will stall and then reverse international efforts to reduce poverty. The poorest countries and most vulnerable citizens will suffer the earliest and most damaging setbacks, even though they have contributed least to the problem. Looking to the future, no country -- however wealthy or powerful -- will be immune to the impact of global warming.[36]

The UNDP report further states that "the threshold for dangerous climate change is an increase of around 2˚C. This threshold broadly defines the point at which rapid reversals in human development and a drift towards irreversible ecological damage would become very difficult to avoid."[37] The UNDP report also estimated that 1.6 percent of global GDP would need to be dedicated to reduce carbon emissions by 50 percent by 2050 (equivalent to two-thirds of the world's expenditure on weapons).[38] The United Nations' level of urgency is slowly finding its way into U.S. electoral debates about how to address climate change, but many candidates -- as well as voters -- acknowledge that climate change is a problem.

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[35] *Ibid*, 10.
[36] *United Nations Human Development Report 2007-2008*, "Fighting Climate Change: Human Solidarity in a Divided World." http://hdr.undp.org/en/reports/global/hdr2007-2008/
[37] *United Nations Human Development Report 2007-2008*, "Fighting Climate Change: Human Solidarity in a Divided World," New York: United Nations Human Development Program, 2007, 9.
[38] Larry Elliot and Ashley Seager, "Crops Hit, More Water Shortages, Higher Sea Levels, Bigger Disease Risk," *The Guardian*, November 28, 2007.

Climate change has been more widely discussed and debated in the 2008 campaign than in previous election cycles. Still, as a *Wall Street Journal* poll found, the war in Iraq, health care, and job creation/economic growth are Americans' top concerns.[39] A greater acceptance of climate change as a policy issue is still reflected in polling data, though this largely falls along party lines, and disagreement persists over how to mitigate climate change.

According to a February 2008 poll released by the Pew Research Center for People and the Press, a majority of Americans favor developing new sources of energy over protecting the environment (54-36 percent). However, more view conservation and regulation as a priority for energy policy over increased exploration, drilling, and building new power plants (55-35 percent, with 10 percent "don't know"). A full 75 percent opposed higher gasoline taxes, but majorities of 90 and 81 percent, respectively, favor better auto fuel efficiency and more funding for alternative energy research.[40]

An October 16-23, 2007 poll conducted by Harris Interactive posed the question, "Do you believe the theory that increased carbon dioxide and other gases released into the atmosphere will, if unchecked, lead to global warming and an increase in average temperatures?" Seventy-one percent of respondents said "yes," 19 percent said "no," and seven percent were "unsure" (compared to 2002, when the numbers were 74 percent yes, 23 percent no, and six percent unsure).

Continuing with the Harris Poll, when asked, 87 percent agreed with the statement that "Since emerging countries such as India and China will soon pass the United States

[39] Jackie Calmes and Michael M. Phillips, "Economy Moves to Fore as Issue for 2008 Voters," *Wall Street Journal*, December 4, 2007.
[40] "Ethanol Research Loses Ground, Continued Division on ANWR: Public Sends Mixed Signals on Energy Policy," *Pew Center for People and the Press*, March 5, 2008 http://people-press.org/reports/pdf/400.pdf (Accessed March 14, 2008).

as the largest contributor of greenhouse gases, what ever is done to control these gases should be undertaken by almost all industrial countries." Furthermore, 81 percent agreed that "As the world's leading industrial country, the United States needs to set the lead when it comes to controlling greenhouse gases and pollution."[41] Even so, public opinion remains split along ideological and party lines.

A Zogby "blind-bio" telephone poll of 527 likely Democratic voters from October 31, 2007 found that "eighty-four percent believe global warming should be a top priority of the next administration."[42] Illustrating the divide between likely Democratic and Republican voters, an Economist/You Gov poll published on November 15, 2007, found that of "likely Democratic voters," 53 percent said that "global warming" is "the most serious environmental problem facing the world today," whereas nine percent of "likely Republican voters" said the same.[43] Besides the obvious divide along party lines, it is worth noting that the question framed the inquiry as the most serious *environmental* problem, rather than public policy problem in general. The same poll found that more than 80 percent of Republicans queried "strongly opposed" the imposition of "higher petrol [gasoline] taxes to reduce carbon dioxide emissions" while a little more than 40 percent of Democrats and nearly 60 percent of Independents also "strongly opposed" taxes on gasoline to combat carbon emissions.

In summary, as Kurt Campbell of the Center for Strategic and International Studies observed in the *New York Times*, "Most public polls on the subject underscore two contradictory findings: one, that Americans now accept that climate change is real and must be dealt with and two, that Americans as yet do not feel that they must make

[41] http://www.pollingreport.com/enviro.htm
[42] http://www.zogby.com/news/ReadNews.dbm?ID=1383
[43] "Getting the Message, At Last," The Economist. November 15, 2007.

personal sacrifices or alter their carbon splurging lifestyles in order to address the problem."[44] As will be shown below, the political will needed in the United States to provide solutions commensurate with the challenges is only just emerging. Furthermore, "The deeper problem is that the world lacks a clear, credible and long-term multilateral framework that charts a course for avoiding dangerous climate change -- a course that spans the divide between political cycles and carbon cycles."[45] Such is the difficult terrain of electoral and expert opinion that the 2008 presidential candidates must traverse.

Politics and Climate Change: State and Local Leadership

Individual states and cities have enacted their own climate change policies, often in support of binding emissions targets, renewable energy programs, and collective action, such as carbon-credit trading schemes. For instance, as of February 2007, 23 states had enacted highly varied renewable energy portfolio standards (RPS) while another 14 were considering legislation to implement a renewable energy standard.[46] In fact, some states, such as California, New Jersey and Wisconsin, have revised their RPS upward because they have reached their targets more quickly than anticipated.

Currently, Texas' RPS stands at approximately 5,880 megawatts by 2015. Texas reached its first RPS goal -- signed into state law in 1999 by then-Governor George W. Bush -- well ahead of schedule. As a result, in 2005, the state legislature increased the RPS to its present level.[47] "The Texas RPS has been so successful that its 10-year goal was met in just over six years. Wind power development in Texas has more than

[44] Kurt Campbell, "Avoiding Climate Change: Why Americans Prevaricate and Delay on Taking Action," *New York Times* (Nicolas Kristoff blog), November 13, 2007.
[45] *Human Development Report 2007-2008*, United Nations Development Program, 12.
[46] Byrne, 4564.
[47] Benjamin K. Sovacool and Jack N. Barkenbus, "Necessary But Insufficient: State Renewable Portfolio Standards and Climate Change Policies," *Environment* 49, no. 6 (2007): 24.

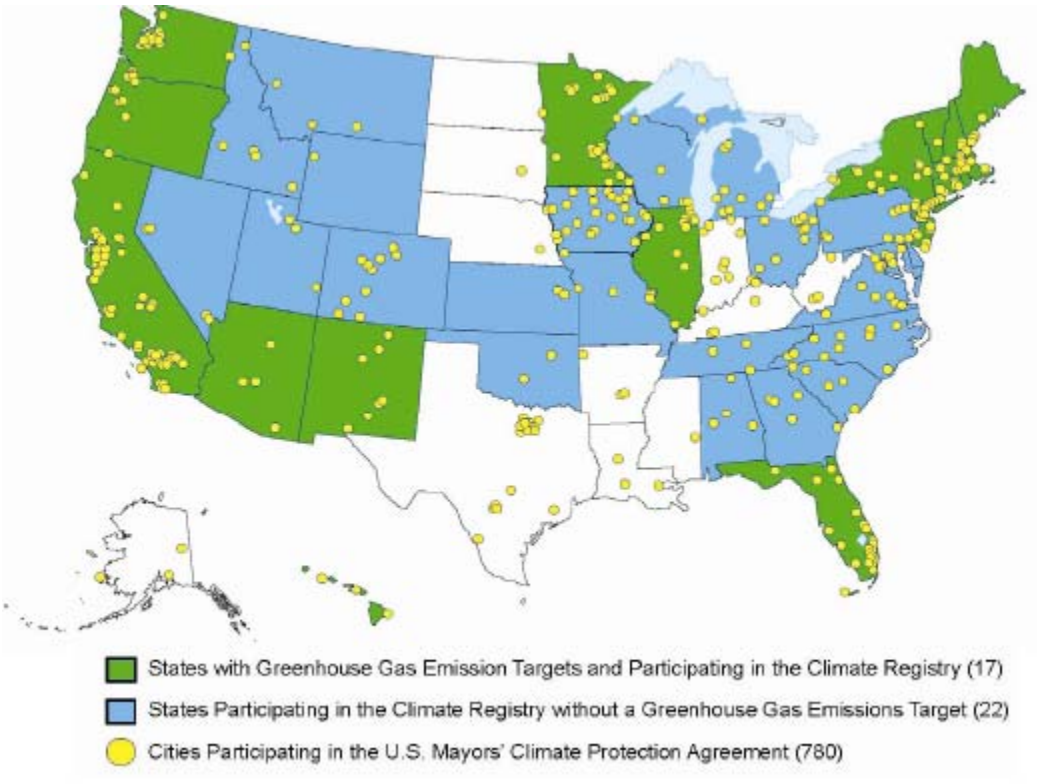
quadrupled since the RPS was established."[48] Also, "due to its competitive pricing, available federal tax incentives and the state's immense wind resources, wind power is expected to remain competitive with coal- and gas-fired plants."[49] In addition to state efforts, city and local governments have pursued their own actions.

New York City Mayor Michael Bloomberg has trumpeted his plan to reduce his city's carbon dioxide emissions 30 percent by 2030. His efforts include transitioning the city's fleet of taxis to hybrid-electric vehicles. Overall, mayors from 780 municipalities have signed the U.S. Conference of Mayors Climate Protection Agreement, which aims to meet Kyoto Protocol standards on carbon emissions by 2012. For example, the City of Houston, TX (city government) has made major progress towards reducing its carbon footprint. In January 2008, the City of Houston "came in at No. 2 on the U.S. Environmental Protection Agency's (EPA) list of top green power-purchasing local government entities […] The City of Houston bought 262.8 million kWh of green [wind] power from Reliant Energy, totaling 20 percent of the city's total demand."[50] Still, a study released in January 2007 by the Institute for Local Self-Reliance found that "Many cities will likely fail in their attempts [to reduce greenhouse gas emissions] unless complementary state and federal policies are put in place."[51] Local and state action is necessary but not sufficient. Federal government leadership continues to be the missing

[48] "Texas Renewable Portfolio Standard," State Energy Conservation Office, Accessed 7 December 2007, http://www.seco.cpa.state.tx.us/re_rps-portfolio.htm
[49] *Ibid*.
[50] Ford Gunter, "City of Houston a Leader in Purchasing Green Power," *Houston Business Journal*, January 28, 2008. http://www.bizjournals.com/houston/stories/2008/01/28/daily10.html?ana=from_rss.
For more, see: http://www.houstontx.gov/environment/index.html.
[51] For analysis of local communities and cities' efforts on climate change, see: John Bailey, "Lessons from the Pioneers: Tackling Global Warming at the Local Level," Institute for Local Self-Reliance (ILSR), January 2007, 3. Available at: http://www.ilsr.org/pubs/pubsalist.html. (Accessed March 17, 2008.)

ingredient for a coherent and robust U.S. response to meeting the challenges of climate change.

Figure 1. U.S. State and Local Climate Change Activities[52]



These state and local initiatives diverge considerably with the federal executive's policies, which have included voluntary emissions targets, the expansion of nuclear energy, opposition to a federal renewable energy standard, and only modest investments for research and development of clean energy solutions. "In contrast to major budget initiatives for 'clean' coal and nuclear generation, renewable energy sources have garnered far lower federal support […] Overall, [Bush] Administration actions have

[52] Source: U.S. House of Representatives, Energy and Commerce Committee, "Climate Change Legislation Design White Paper: Appropriate Roles for Different Levels of Government," Available at: http://energycommerce.house.gov/ (Accessed February 29, 2008).

served to stall meaningful national policy on climate change."[53] In 2007, "a multi-state Climate Registry was launched to establish a common protocol for greenhouse gas emissions reporting due to the lack of such a protocol at the Federal level. The Registry now has 39 member States plus the District of Columbia [as of February 2008]."[54] It is in this light that the significance of state and local initiatives should be seen.

In fact, the 10 leading carbon-emitting U.S. states account for 50 percent of total U.S. carbon emissions, according to a study conducted by the Congressional Research Service (CRS). The study, which examined and compared the GHG emissions of individual U.S. states, concluded that:

> The carbon content of energy use in a state is determined by a state's portfolio of energy sources. States that utilize a high percentage of coal, for example, will have a relatively high carbon content of energy use, compared to states with a lower dependence on coal. An additional factor is whether a state is a net exporter or importer of electricity, because CO2 emissions are attributed to electricity-producing states, but the electricity is used (and counted) in the consuming state.[55]

Between 1990 and 2000, the United States reduced its GHG intensity by 1.6 percent annually. Assuming that population and per capita income continue to grow as expected, the United States would need to reduce its GHG intensity at the rate of three percent per year in order to halt the annual growth in GHG emissions. Therefore, achieving

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[53] Byrne, 4557 and 4558; "Global Warming: Getting the Message, At Last," *The Economist*. November 15, 2007.

[54] Source: U.S. House of Representatives, Energy and Commerce Committee, "Climate Change Legislation Design White Paper: Appropriate Roles for Different Levels of Government," Available at: http://energycommerce.house.gov/ (Accessed February 29, 2008). Climate Registry: http://www.theclimateregistry.org

[55] "State Carbon Rankings," *Energy Washington Week/News Room Blog*, December 10, 2007. http://www.energywashington.com/blog/index.php

reductions (or negative growth) in GHG emissions would necessitate further declines in GHG intensity.[56]

The CRS analysis suggests that states with lower-carbon intensity or those working to reduce their carbon intensity, such as California, may be more able to meet a national renewable energy standard than states with relatively high concentrations of coal-fired electricity. California's proactive stance on climate change, demonstrated by the enactment of path-breaking legislation to promote renewable energy and reduce greenhouse gas emissions, can also be seen as an attempt by the state to position itself at the forefront of environmentally-friendly energy growth and investment.

California's Climate Change Policies

California's statewide policies on climate change have garnered worldwide attention for their rigor and ambition, while setting the pace for similar initiatives by other U.S. states. With one of the largest economies in the world, California is a major GHG emitter. "In terms of total carbon dioxide (CO_2) emissions from the combustion of fossil fuels, for 2003, California ranked second only to Texas within the United States and eleventh in the world."[57] The state is the ninth largest emitter of greenhouse gases per capita in the world.[58]

In 2006, the California state assembly passed sweeping legislation to limit GHG emissions -- the *Global Warming Solutions Act of 2006*, also known as Assembly Bill

[56] Jonathan L. Ramseur, "State Greenhouse Gas Emissions: Comparison and Analysis," *Congressional Research Service*, December 5, 2007, p. 2 (summary).
http://www.energywashington.com/secure/data_extra/dir_07/ew2007_3746.pdf (also at: http://www.fpc.state.gov/c18183.htm)
[57] Pamela M. Doughman, "California's Climate Change Policies: Raising the Bar," *Environment* 49, no. 7 (2007) 35-43: 35.
[58] "California's Program to Reduce the Impacts of Global Warming: Questions and Answers," Fact Sheet, Government of California, June 1, 2005.
http://www.climatechange.ca.gov/climate_action_team/factsheets/2005-06_CAT_Q+A.PDF

(AB) 32. The bill, which California Governor Arnold Schwarzenegger signed into law, confirms the state's mid-range target of reducing emissions to 1990 levels by 2020. AB 32 further requires that the California Air Resources Board (CARB) establish an economy-wide emissions cap based on the 1990 emissions level. The cap will take effect in 2012 and become more stringent over time. Finally, AB 32 directs the CARB to formulate a regulatory framework in which to implement the cap and monitor and measure emissions levels. The law does not explicitly demand the implementation of a cap-and-trade system but instructs regulators to consider market-based mechanisms, which could include a cap-and-trade system or a carbon fee on fossil fuels. The CARB must submit a plan detailing how to implement the cap by January 1, 2009. [59]

Although post-2020 emissions targets were not codified by AB 32, Executive Order S-3-05 issued in June 2005 by Governor Schwarzenegger established a long range target of reducing greenhouse gas emissions 80 percent below 1990 levels by 2050.[60] While "California's targets start off more gradually" compared to similar efforts in New England, "California's long-term target is more aggressive than the target the IPCC has advised that the world must achieve to stabilize climate change at 2 to 2.4 degrees above pre-industrial levels."[61] Finally, AB 32 serves as the framework, or coordinating legislation, for California's climate change programs.[62]

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[59] Assembly Bill 32, Legislative Digest: http://www.arb.ca.gov/cc/docs/ab32text.pdf; "Fact Sheet: Landmark Global Warming Legislation," Office of the Governor of California, http://gov.ca.gov/index.php?/fact-sheet/4445/ (Accessed March 3, 2008); "AB 32: Global Warming Solutions Act," Union of Concerned Scientists, http://www.ucsusa.org/assets/documents/global_warming/AB-32-as-passed-fact-sheet.pdf (Accessed March 3, 2008)

[60] http://gov.ca.gov/executive-order/1861/

[61] Doughman, 37. Based on the IPCC's 2007 Report.

[62] Doughman, 36.

To reduce the carbon intensity of transportation fuels in California, Governor Schwarzenegger issued Executive Order S-01-07 in January 2007 directing state agencies to create a low-carbon fuel standard.[63] "By 2020 the standard will reduce the carbon intensity of California's passenger vehicle fuels by at least 10 percent. This first-of-its kind standard will support AB 32 [2006] emissions targets as part of California's overall strategy to fight global warming."[64] The executive order "requires fuel producers to ensure that the mix of fuel they sell into the California market meets, on average, a declining standard for GHG emissions measured in CO2-equivalent gram per unit of fuel energy sold."[65] Fuel providers will be able to utilize market mechanisms to meet the standard. "Providers may purchase and blend more low-carbon ethanol into gasoline products, purchase credits from electric utilities supplying low carbon electrons to electric passenger vehicles, diversify into low carbon hydrogen as a product and more, including new strategies yet to be developed."[66] The final version of California's low carbon fuel standard is expected to be promulgated in December 2008. In a related measure, on June 14, 2007, the CARB modified state regulations to allow up to 10 percent ethanol in reformulated gasoline beginning December 31, 2009 in line with federal law.[67]

California has supported a state-wide renewable energy standard, in part to enhance its energy security. "In light of the unwieldy wholesale electricity prices California faced in 2000 and 2001, and other problems in the market, California's efforts

[63] http://gov.ca.gov/index.php?/executive-order/5172/
[64] "Gov. Schwarzenegger Issues Directive to Establish World's First Low Carbon Standard for Transportation Fuels," Press Release, January 9, 2007.
[65] Ibid.
[66] Ibid.
[67] Doughman, 38.

to restructure the market have shifted direction, which spawned the creation of the RPS."[68] The power company Southern California Edison reached 17.5 percent out of the state's 20 percent renewable energy mandate in 2006, prompting the state to adjust its RPS to 20 percent by 2010, ten years earlier than the original goal.[69] California's government has sought to increase solar power use in the state through the California Solar Initiative/Million Solar Roofs Program. The solar program aims to place 3,000 megawatts of solar-produced electricity systems on rooftops by 2018.

California's attempt to regulate vehicle tailpipe emissions of greenhouse gases has been the most difficult initiative to implement. In 2002, California passed Assembly Bill 1493 (the Pavley Law), which then-Governor Gray Davis signed into law. AB 1493 requires automakers to limit carbon dioxide emissions from vehicle tailpipes. It specifically calls for exhaust to be cut from cars and light trucks by 25 percent and from larger vehicles by 18 percent. Under the law, the auto industry will have to begin introducing cleaner technology by 2009 and comply with the exhaust reductions by 2016. In September 2004, the CARB formally adopted the standards and sought federal government approval -- which has not yet been forthcoming.

Critics of California's standards, including some members of Congress, have argued that the state not only would open a back door to regulation above and beyond what the federal government has required but also place an undue burden upon automakers:

[68] "Renewable Energy Program: Annual Report to the Legislature," California Energy Commission, October 2007, p. 2. http://www.energy.ca.gov/.
[69] Byrne, 4564. California law also requires publicly-owned utilities to report their specific goals and progress to the California Energy Commission.

> The emissions standards California proposed in 2004 -- but never approved by the federal government -- would have forced automakers to cut greenhouse gas emissions by 30 percent in new cars and light trucks by 2016, with the cutbacks to begin in 2009 models. That would have translated into roughly 43 miles per gallon for cars and some light trucks and about 27 miles per gallon for heavier trucks and sport utility vehicles. The new federal law will require automakers to meet a 35-mile-per-gallon fleetwide standard for cars and trucks sold in the United States by 2020. It does not address carbon dioxide emissions, but such emissions would be reduced as cars were forced to become more fuel efficient.[70]

So far, the EPA has opposed California's plan to regulate vehicular GHG emissions.

The Clean Air Act permits California to enact more rigorous statewide regulation of vehicle emissions in place of federal standards but only after obtaining a waiver from the EPA to proceed.[71] (Other states may adopt either the federal government's standards or California's.) In order to enact its GHG emissions standards, California applied in December 2005 for a waiver from the EPA. Nearly two years later, the EPA had not issued a decision. Fed-up California officials filed a lawsuit in November 2007 to spur the EPA to act. Finally, in December 2007, the EPA rejected California's request for a waiver, sparking protests from California lawmakers and environmental activists.

The EPA ruled that federal law should take precedence. Its ruling favored the 35 mile per gallon (by 2020) standard mandated by Congress in the Energy Independence and Security Act (EISA) of 2007. In response, California filed a lawsuit against the EPA

[70] John S. Broder and Felicity Barringer, "E.P.A. Says 17 States Can't Set Emission Rules," *New York Times*, December 20, 2007.
[71] Robert Barnes and Juliet Eilperin, "High Court Faults EPA Inaction on Emissions," *Washington Post*, April 3, 2007, p. A-1.

in January 2008. However, negotiation, and the arrival of a new president in 2009, may make extended litigation unnecessary. Congress could also change the applicable law to allow California to continue. In addition, the U.S. Supreme Court ruled 5-4 in 2007 that GHG emissions are air pollutants and as such fall under the EPA's regulatory authority. The Bush administration had argued unsuccessfully that carbon dioxide was not an air pollutant subject to federal regulation.

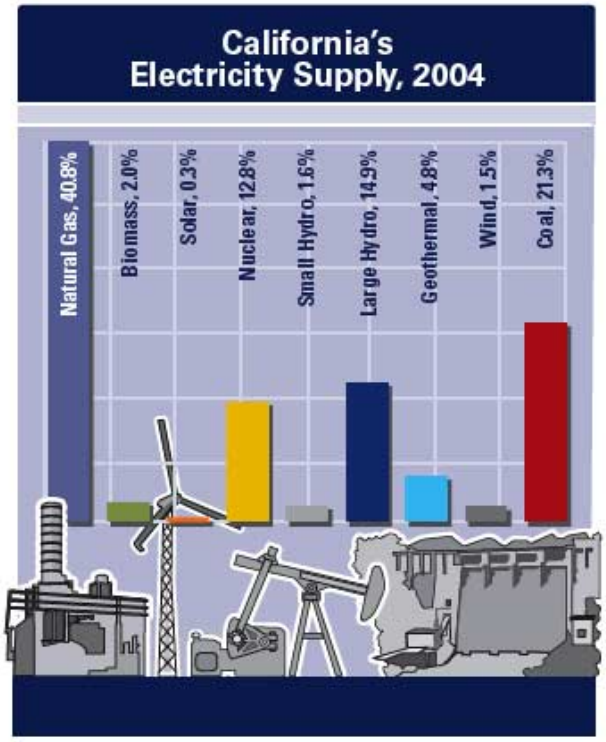
Debate over how to regulate greenhouse gas emissions from vehicles has also reached Congress. A white paper released by the House of Representatives' Energy and Commerce Committee points to tension within the Democratic Party between Speaker Nancy Pelosi (D-CA) and other strong advocates of renewable energy and GHG regulation on one hand, and Committee Chairman John Dingell (D-MI) and many automobile manufacturers on the other. According to the paper,

> Chairman Dingell has made it very clear that he believes that motor vehicle greenhouse gas standards should be set by the Federal Government, not by State governments: greenhouse gases are global (not local) pollutants, multiple programs would be an undue burden on interstate commerce and would waste societal and governmental resources without reducing national emissions, and the competing interests of different States should be resolved at the Federal level. Other Committee Members have reached the opposite conclusion given the severity of the climate change problem, the need to push technological development, and the benefits of having States act as laboratories.[72]

[72] Source: U.S. House of Representatives, Energy and Commerce Committee, "Climate Change Legislation Design White Paper: Appropriate Roles for Different Levels of Government," Available at: http://energycommerce.house.gov/ (Accessed February 29, 2008), p. 25.

The tension between activist state policies and less ambitious federal legislation looks likely to persist at least until a new president takes office. (For a detailed discussion of federal-state roles under a national climate change mitigation scheme, see: Robert B. McKinstry, John C. Dernbach, and Thomas D. Peterson, "Federal Climate Change Legislation as if the States Matter," *Natural Resources and Environment*, winter 2008.)

Figure 2. California's Electricity Supply, 2004



Source: California Energy Commission, 2005 Integrated Energy Policy Report

Regional and Sub-national Initiatives

It remains unclear whether, in the absence of comprehensive national legislation, states' actions to combat climate change will achieve significant reductions in greenhouse gas emissions. Still, state actions have been the most progressive. In a speech to the U.S. Conference of Mayors in July 2007, Governor Schwarzenegger bluntly described his

approach saying, "Just like you mayors are doing, we are applying leverage so that at some point the whole environmental thing will tip. We are not waiting for Washington."[73] At the same event, Patricia Christensen, mayor of Port St. Lucie, Florida, agreed with Governor Schwarzenegger, saying that "Washington is taking too long. It really is up to cities and towns to lower fuel emissions."[74] However, state and municipal efforts to combat climate change, such as state-based renewable energy portfolio standards, may not by themselves achieve the goals sought by policymakers and the public. According to the 2006 *Annual Energy Outlook* released by the U.S. Department of Energy's (DOE) Energy Information Administration, state actions would be inadequate by themselves to meet, for example, a five percent emissions reduction below 1990 levels by 2012 set by the Kyoto Protocol, though of course the United States is not a party to the protocol.[75]

The development of state initiatives such as those in California has also spurred movement to link different climate change programs together along regional -- and now transnational -- lines. In 2003, the state of New York banded together with other mid-Atlantic and New England states to form the Regional Greenhouse Gas Initiative (RGGI).[76] The initiative focuses on emissions trading in the regional electricity sector. The member states of the initiative aim "to stabilize carbon dioxide emissions from their power plants at 151 million short tons (137 metric tons)" in the years 2009-2015, while "between 2015 and 2020, the RGGI plan calls for a 10% emissions reduction below the

[73] Jia-Rui Chong, "Gov.'s Climate Change Speech Is a Hit," *Los Angeles Times*, July 22, 2007.
[74] *Ibid.*
[75] Sovacool and Barkenbus, "Necessary but Insufficient: State Renewable Portfolio Standards and Climate Change Policies," 23; and U.S. Energy Information Administration (EIA), *Annual Energy Outlook 2006*: *With Projections to 2030* (Washington, DC: Department of Energy, 2006), 81.
[76] http://www.rggi.org/

cap."[77] RGGI's participating states have announced that they will sell -- rather than give away for free -- the first carbon permits under the system in September 2008.

In the West, a number of U.S. states and the Canadian provinces of British Columbia and Manitoba have formed a second regional partnership, the Western Climate Initiative (WCI).[78] Key elements of the WCI's first mitigation proposal include: (a) covering emissions from all electricity sources in the region; and (b) limiting "contract shuffling" loopholes by preventing high-carbon power from being sent outside the WCI area in exchange for low-carbon power. The proposal does not address vehicle GHG emissions, which may be considered for regulation once additional analysis is completed.[79] In late 2007, governors from six Midwestern states and the Canadian province of Manitoba agreed to a third regional pact, the Midwestern Greenhouse Gas Reduction Accord.[80]

Individual state initiatives have, in some cases, formed the basis for coordinated regional policies, which have, in turn, put pressure on national governments and multinational corporations to respond. "The formation of a collaborative, bi-coastal GHG control regime would impact a significant portion of the US population and economy."[81] Indeed, a consortium of New England state agencies responsible for regulating air quality, which jointly direct their work to reduce greenhouse gas emissions through the Northeast States for Coordinated Air Use Management (NESCAUM), have sought to

[77] Byrne, 4560.
[78] http://www.westernclimateinitiative.org/
[79] Scott Learn, "Climate Plan Phases Approach," *The Oregonian*, March 12, 2008 http://www.oregonlive.com/news/oregonian/index.ssf?/base/news/120529230421830.xml&coll=7
[80] http://www.midwesterngovernors.org/govenergynov.htm
[81] Byrne, 4560.

coordinate their plans with counterparts at California's Climate Action Registry.[82] It should be added that, while the U.S. government has not yet moved to develop a cap-and-trade system, the Canadian government "has allocated $66-million to develop the necessary certification and regulatory structure" for a Canadian emissions trading scheme.[83] Businesses have begun to take action, too. A consortium of major environmental advocacy organizations and multinational corporations formed the U.S. Carbon Action Partnership (USCAP) in 2007 to lobby for a federally-regulated cap-and-trade system instead of a patchwork of state policies.[84]

The most prominent transnational action taken to date may be the formation of the International Carbon Action Partnership (ICAP), which was officially created in October 2007. Members of ICAP include a number of sovereign nation-states,[85] the E.U., and a variety of state and provincial governments from North America. The American states and Canadian provinces that are parties to ICAP in turn divide along coastal lines, with the WCI on one hand, and the RGGI on the other.[86] ICAP represents an international extension of the state and regional initiatives developed in Europe and North America,

[82] Byrne, 4560. "The California Climate Action Registry (the Registry) was established by California statute as a non-profit voluntary registry for GHG emissions. The purpose of the Registry is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emission reduction requirements may be applied." http://www.climateregistry.org/

[83] Shawn McCarthy, "National Carbon Market Faces Opposition," *The Globe and Mail* (Toronto, Canada), March 12, 2008, (accessed March 12, 2008). http://www.theglobeandmail.com/servlet/story/LAC.20080312.ROFFSET12/TPStory/Business

[84] As of December 2007, USCAP members included: Alcan Inc., Alcoa, American International Group, Inc. (AIG), Boston Scientific Corporation, BP America Inc., Caterpillar Inc., Chrysler LLC, ConocoPhillips, Deere & Company, The Dow Chemical Company, Duke Energy, DuPont, Environmental Defense, Exelon Corporation, Ford Motor Company, FPL Group, Inc., General Electric, General Motors Corp., Johnson & Johnson, Marsh, Inc., National Wildlife Federation, Natural Resources Defense Council, The Nature Conservancy, NRG Energy, Inc., PepsiCo, Pew Center on Global Climate Change, PG&E Corporation, PNM Resources, Rio Tinto, Shell, Siemens Corporation, World Resources Institute, and Xerox Corporation.

[85] ICAP member countries include: France, Germany, Greece, Ireland, Italy, Netherlands, New Zealand, Norway, Portugal, Spain, and the United Kingdom.

[86] RGGI members include: Maine, Maryland, Massachusetts, New Jersey, and New York. WCI members include: Arizona, British Columbia, California, Manitoba, Montana, New Mexico, Oregon, and Washington State. Utah is a member of the WCI but not ICAP.

even without the participation of the U.S. federal government. According to a press release, one of ICAP's stated aims is "encouraging common approaches and furthering partners' [ability to link] together to expand the global carbon market, helping to prevent leakage."[87] Given state and localities support for legislation addressing climate change, what accounts for the relative lack of action at the federal level?

The Response from Washington

A variety of factors -- including public opposition to a carbon tax on gasoline, defects of the Kyoto Protocol, opposition to mandatory carbon emissions by President Bush, and lobbying by major oil and gas companies, automakers, and groups skeptical of climate change science -- generally account for the dearth of action by Congress and the White House. Public opinion consistently has opposed the imposition of gasoline taxes, which might moderate or reduce demand, even though large majorities support investment in renewable and alternative energy sources. While many climate change bills have been introduced in Congress, few have had much chance of success until recently. According to the Pew Center on Global Climate Change, the "Climate Security Act" proposed by Senators Joe Lieberman (I-CT) and John Warner (R-VA) in 2007 has been the leading Senate bill in the 110th Congress. So far, few Americans are willing to make the explicit financial adjustments necessary to support a comprehensive energy climate plan in the marketplace through direct taxation, even though a cap-and-trade system could also entail higher prices, albeit hidden or implicit in the regime.[88] Indeed, the Senate passed a non-binding resolution 95-0 against the Kyoto Protocol in 1997, in great

[87] "Nations, States, Provinces Announce Carbon Markets Partnership to Reduce Global Warming," Press Release, International Carbon Action Partnership, October 29, 2007. http://www.icapcarbonaction.com/pr20071029.htm

[88] Byrne, 4506; Kurt Campbell, "Avoiding Climate Change: Why Americans Prevaricate and Delay on Taking Action," *New York Times* (Nicolas Kristoff blog), November 13, 2007.

measure due to the belief that the Kyoto framework would grievously impact the U.S. economy while not including mandatory emissions caps for major developing countries, namely China and India.[89]

Energy corporate interests also have affected the outcome of U.S. federal policymaking. In 2007, oil and gas companies lobbied successfully in the Senate to block passage of the original House of Representatives' EISA bill, which included a provision to repeal tax breaks worth U.S. $13 billion to fund incentives for renewable energy. Advocates for the oil and gas industry argued that the bill amounted to "unsound legislation" because it removed government-backed financial incentives for additional drilling for hydrocarbons within the United States.[90] The oil and gas industry won a modest victory in 2006 when President Bush signed into law the Gulf of Mexico Energy Security Act, which opened previously restricted parts of the central and eastern Gulf to drilling. For many decades until 2007, the automobile industry successfully blunted attempts to increase corporate average fuel economy (CAFE) standards.

The year 2007 was a watershed year for federal energy and climate change legislation. The EISA will raise CAFE standards to 35 miles per gallon (mpg) by 2020. It also supports the increased use of renewable fuels -- biofuels in particular. The estimated 40 percent gain in fuel economy may cut more than 6 billion metric tons of greenhouse gas emissions by 2030. The auto industry prevailed in keeping separate standards for cars and light trucks but failed to secure a lower 32 mpg target.[91] Even Toyota became the

[89] "U.S. Senate Roll Call Votes 105th Congress - 1st Session as compiled through Senate LIS by the Senate Bill Clerk under the direction of the Secretary of the Senate," On the Resolution (s.res.98), United States Senate/Library of Congress, July 11, 1997. http://thomas.loc.gov/cgi-bin/bdquery/z?d105:SE98

[90] David Ivanovich, "House OKs Energy Bill, New Fuel Standards," *Houston Chronicle*, December 7, 2007.

[91] October 2007 U.S. auto sales statistics: 55 percent of U.S. auto sales were pick-up trucks and SUVs while hybrids were only two percent. However, October 2007 sales of small cars in the U.S. were up 12.5

target of an advertisement campaign by environmentalists for opposing higher CAFE standards while touting hybrid cars like the Toyota Prius at the same time. The increase in CAFE standards was a truly signal agreement achieved through delicate negotiations between House Speaker Pelosi and Representative Dingell, chairman of the House Committee on Energy and Commerce. The 2007 EISA also included a $125 million spending authorization (Title X in the EISA, also known as the "Green Jobs Act") to provide job training in the renewable energy sector.[92]

Yet the 2007 EISA that President Bush signed into law left much unfinished business. The House's original version of the bill included ambitious measures to promote renewable energy that did not survive. The original bill included a 15 percent renewable energy portfolio standard and the repeal of tax breaks worth billions to the oil and gas industry. Critics attacked the proposed federal renewable energy standard as uneconomic and ill-conceived. Still, it should be noted that according to the failed House bill, utilities could claim efficiency gains for four percent of their requirements under the standard, while municipal utilities, federal agencies, and rural electricity cooperatives were exempt, not to mention that many states' own renewable energy standards have been at least as rigorous if not more. A federal RPS is likely to be considered by

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percent compared to Oct. 2006, and SUV sales fell 7.6 percent. Retail gasoline prices averaged U.S. $2.87during October 2007. (Wall Street Journal, November 11, 2007; Consumer Reports and EIA, October 29, 2007).

[92] "This title authorizes up to $125 million in funding to establish national and state job training programs, administered by the Department of Labor, to help address job shortages that are impairing growth in green industries, such as energy efficient buildings and construction, renewable electric power, energy efficient vehicles, and biofuels development." Fred Sissine, "Energy Independence and Security Act of 2007: A Summary of Major Provisions," *Congressional Research Service*, December 21, 2007, p. 18. Available at: http://energy.senate.gov/public/_files/RL342941.pdf (Accessed May 6, 2008). For the text of the bill as enacted into law (Public Law 110-140), see: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_public_laws&docid=f:publ140.110.pdf

Congress in the future: draft legislation proposing to create an RPS was introduced 17 times between 1997 and 2006.[93]

The second major piece of legislation in 2007 to address energy climate issues was the bill proposed by Senator Joe Lieberman (I-CT) and Senator John Warner (R-VA) -- the Climate Security Act of 2007 (S.2191), commonly known as the Lieberman-Warner bill. It is, perhaps, the most viable climate change bill to be introduced since the 2006 Congressional elections. In December 2007, it was successfully voted out of the U.S. Senate Committee on Environment and Public Works (EPW) for potential consideration by the full Senate. (In 2003, the Senate voted 55-43 against Senators John McCain (R-AZ) and Joe Lieberman's "Climate Stewardship Act.")

A Look at S.2191: The Lieberman-Warner Bill/Climate Security Act

The Lieberman-Warner bill has proposed the creation of an auction-based cap-and-trade system, which would reduce GHG emissions -- from regulated facilities -- by 19 percent below 2005 levels in 2020 and by 70 percent below 2005 levels by 2050.[94] Total U.S. greenhouse gas emissions could be reduced by 62 to 66 percent under 2005 levels by 2050 (see chart below for a breakdown of emission reductions relative to baseline measurements). The cap envisioned under the bill would cover an estimated 87 percent of sources responsible for U.S. GHG emissions, e.g., from the electricity, transportation, and manufacturing sectors.

[93] Sovacool and Barkenbus, "Necessary but Insufficient: State Renewable Portfolio Standards and Climate Change Policies," 23.
[94] http://lieberman.senate.gov/issues/globalwarming.cfm; and, http://lieberman.senate.gov/documents/detailedacsa.pdf; and, http://lieberman.senate.gov/documents/lwcsaonepage.pdf

Table 1. Projected Emissions Reductions from Implementation of S. 2191[95]

Emissions Reductions	IPCC Recommendation	S.2191 Covered Facilities	S.2191 Total U.S. Emissions
Relative to 1990	43 to 83%	66%	56 to 60%
Relative to 2000	50 to 85%	70%	61 to 65%
Relative to 2005	51 to 85%	71%	62 to 66%

Source: Senator Lieberman's Office, F.A.Q., Climate Change/Lieberman-Warner Bill

Auctioned credits -- covering industry -- would gradually rise from 26.5 percent in 2012 to 41 percent in 2022 and reach 69.5 percent in 2031.[96] Freely-given allocations to industry would be phased out by 2031. However, "entities other than regulated emitters," such as states, would receive set percentages of free allocations for a variety of mitigation initiatives and low-income consumer assistance.[97] "Under the program, emissions allowances would be set at progressively lower levels each year between 2012 and 2050, and companies would be able to exchange emissions allowances with one another."[98]

An amendment by Senator Lamar Alexander (R-TN) added a low carbon fuel standard (LCFS). "The Alexander amendment was approved by the EPW Committee in a bipartisan vote of 13-6 -- which made it the only Republican-sponsored amendment to

[95] "Frequently Asked Questions about Global Climate Change" and "Frequently Asked Questions on the Lieberman-Warner Climate Security Act," Office of U.S. Senator Joe Lieberman, http://lieberman.senate.gov/documents/lwcsafaq.pdf (Accessed April 4, 2008).
[96] http://lieberman.senate.gov/documents/acsaemission.pdf
[97] For a discussion of federal-state roles under a national climate change mitigation scheme, see: Robert B. McKinstry, John C. Dernbach, and Thomas D. Peterson, "Federal Climate Change Legislation as if the States Matter," Section of Natural Resources Law, *Natural Resources and Environment*, Winter 2008 Available at SSRN: http://ssrn.com/abstract=1031552
[98] Lauren O'Neill, "Senate Panel Passes Climate Bill; Features Cap-and-Trade System," *Natural Gas Week*, December 10, 2007. See also: Daniel J. Weiss and Alexandra Kougentakis, "Waitin' On A Sunny (and Windy) Day," *Center for American Progress*, April 1, 2008 ,http://www.americanprogress.org/ (Accessed April 2, 2008).

pass the committee in a roll call vote."[99] The LCFS would mandate five percent less carbon per unit of energy in 2015 and 10 percent less carbon per unit of energy in 2020.

The Lieberman-Warner bill also has included allocating revenue from the auctions for advanced energy research (two percent), deployment of clean energy technologies (52 percent), financial assistance for low-income consumers to offset higher prices (18 percent), wildlife adaptation (18 percent), worker training for green jobs (five percent), and international adaptation assistance (five percent).

The bill would permit international credit trading -- a.k.a. international emission allowances trading -- with other countries whose emissions cap stringency and market integrity meet U.S. standards. Per year, 15 percent of scheduled reductions could be met this way. In addition, the bill freely allocates 2.5 percent of emission allowances for international forest protection to help reduce deforestation, which causes an estimate 20 percent of global carbon dioxide emissions.

A controversial provision in the Lieberman-Warner bill would place a tariff on imported goods from countries without regulations on greenhouse gases. "If a major emitting nation has not taken comparable action within eight years, the president is authorized to require importers of greenhouse-gas-intensive manufactured products to submit emissions credits of equivalent value to credits the U.S. system effectively requires of domestic manufacturers."[100] This provision could face challenges at the WTO. Finally, under the bill, the emissions cap would not take effect until 2012, a delay that environmental advocacy groups like the Sierra Club have opposed.

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[99] "[Senator] Alexander Calls for Research on How Tennessee Will Be Impacted by Low Carbon Fuel Standards," Press Release, January 2, 2008, http://alexander.senate.gov/ (Accessed April 2, 2008).
[100] "Frequently Asked Questions on the Lieberman-Warner Climate Security Act," Office of U.S. Senator Joe Lieberman, http://lieberman.senate.gov/documents/lwcsafaq.pdf (Accessed April 4, 2008).

Table 2. How S.2191 (as reported from EPW) Allocates

2012 EMISSION ALLOWANCE ACCOUNT		2022 EMISSION ALLOWANCE ACCOUNT		2031 EMISSION ALLOWANCE ACCOUNT	
Recipient	%	Recipient	%	Recipient	%
TRANSITION ASSISTANCE:					
Fossil Fuel-Fired Power Plants	19	Fossil Fuel-Fired Power Plants	13	Fossil Fuel-Fired Power Plants	0
Energy Intensive Manufacturing	10	Energy Intensive Manufacturing	7	Energy Intensive Manufacturing	0
Companies That Took Early Action	5	Companies That Took Early Action	0	Companies That Took Early Action	0
CO_2 Sequestration Bonus Account	4	CO_2 Sequestration Bonus Account	4	CO_2 Sequestration Bonus Account	0
Petroleum Importers and Refiners	2	Petroleum Importers and Refiners	1.75	Petroleum Importers and Refiners	0
HFC Producers and Importers	2	HFC Producers and Importers	1.75	HFC Producers and Importers	0
Rural Electric Cooperatives	1	Rural Electric Cooperatives	1	Rural Electric Cooperatives	0
TOTAL	43	TOTAL	28.5	TOTAL	0
ENTITIES OTHER THAN REGULATED EMITTERS:					
Annual Auction and Early Auction	26.5	Annual Auction	41	Annual Auction	69.5
States	10.5	States	10.5	States	10.5
Electricity Consumers	9	Electricity Consumers	9	Electricity Consumers	9
U.S. Farmers and Foresters	5	U.S. Farmers and Foresters	5	U.S. Farmers and Foresters	5
International Forest Protection	2.5	International Forest Protection	2.5	International Forest Protection	2.5
Natural Gas Consumers	2	Natural Gas Consumers	2	Natural Gas Consumers	2
Reducing Coal Mine, Landfill Methane	1	Coal Mine, Landfill Methane	1	Reducing Coal Mine, Landfill Methane	1
Tribal Governments	0.5	Tribal Governments	0.5	Tribal Governments	0.5
TOTAL	57	TOTAL	71.5	TOTAL	100
Uses of Auction Proceeds	%	Uses of Auction Proceeds	%	Uses of Auction Proceeds	%
Technology Deployment	52	Technology Deployment	52	Technology Deployment	52
Low-Income Energy Consumers	18	Low-Income En. Consumers	18	Low-Income Energy Consumers	18
Wildlife Adaptation	18	Wildlife Adaptation	18	Wildlife Adaptation	18
International Adaptation	5	International Adaptation	5	International Adaptation	5
Worker Training	5	Worker Training	5	Worker Training	5
Advanced Energy Research	2	Advanced Energy Research	2	Advanced Energy Research	2
TOTAL	100	TOTAL	100	TOTAL	100
TOTAL	**100**	**TOTAL**	**100**	**TOTAL**	**100**

Source: Senator Lieberman's Office/Official Website

The potential costs of regulating carbon dioxide emissions will probably be fiercely debated as climate change legislation moves through Congress. A report released by the EPA in March 2008 said that, if the Lieberman-Warner bill were enacted, there would be only a one percentage point loss in GDP during the forecast period of 2010-2030. The determination includes the assumption of major new growth in nuclear power generation, as well as reductions in GHG emissions due to measures contained in the 2007 EISA. However, the EPA also found that if the Lieberman-Warner bill is

implemented, electricity prices could rise 44 percent by 2030 and gasoline prices could increase 53 cents per gallon by 2030.[101]

Some industry groups have criticized the Lieberman-Warner bill. The American Gas Association, for example, has said that the bill would increase natural gas prices and favor certain kinds of fuels over others.[102] The lobby group Industrial Energy Consumers of America also argued in an open letter to U.S. Senators James Inhofe (R-OK) and John Barrasso (R-WY) that:

> Short of a significant recession, to achieve 2005 emission levels in 2012 the electric utility sector will need additional quantities of natural gas that exceed the amount used in total by the manufacturing sector. They can do so because they can pay any price for natural gas, no matter how high and pass the costs onto their ratepayers. This is why we are concerned with emission targets which begin before additional supply of natural gas, new technologies or other efficiency improvements can be put into practice... In our opinion, all previous EIA or EPA economic analysis on climate change legislation does not adequately address the issue of electric utility fuel switching from coal to natural gas and the costs implications to higher natural gas and electricity prices or the loss of resulting manufacturing jobs.[103]

Yet, the industry view is not held by all. At the same time that the Lieberman-Warner bill passed its first test in committee, McKinsey & Company, a global consulting firm,

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[101] Stephen Power, "EPA Says Carbon Caps Won't Harm Economy Much," *Wall Street Journal*, March 18, 2008, p. A2.
[102] *Ibid*.
[103] Letter to Sens. Inhofe and Barraso from the Industrial Energy Consumers of America, October 30, 2007. http://www.ieca-us.com/documents/InhofeBarrassoQuestionsEPWOct242007.pdf

released a major study suggesting that the United States could reduce its emissions at a relatively lower cost than widely expected. As contended by the McKinsey & Co. study, the United States could prevent a forecasted 35 percent rise in GHG emissions by 2030 through utilizing energy efficiency measures, transitioning to much cleaner power plants, increasing the use of renewable energy, and vastly improving the market-share of hybrid fuel vehicles.

According to the McKinsey study, the cost of eliminating about 3 billion tons of carbon discharges would cost U.S. $1.1 trillion by 2030 or 1.5 percent of new economic investment. [104] In one scenario, power plants would account for 27 percent of the carbon reduction, upgraded and more efficient buildings and appliances would provide a 24 percent reduction, and new cars and trucks would supply an additional 11 percent reduction.[105] The U.K. government's Report on the Economics of Climate Change (The Stern Review) is another authoritative but not universally accepted reference.[106]

The views of industry and others mentioned here, all too briefly, serve to illustrate that the debate over the economics of climate change is far from settled. Updated economic analyses will be essential as new scientific information about the urgency of mitigation becomes available. Indeed, while the science of climate change has become more widely embraced by the public and policymakers alike, debate continues to rage

[104] "Reducing Greenhouse Gas Emissions: How Much, At What Cost?" (Executive Summary), McKinsey & Company, 2007. http://www.mckinsey.com/clientservice/ccsi/greenhousegas.asp
[105] The McKinsey study concludes that "the United States could reduce GHG emissions in 2030 by 3.0 to 4.5 gigatons of CO2e using tested approaches and high-potential emerging technologies. These reductions would involve pursuing a wide array of abatement options with marginal costs less than $50 per ton, with the average net cost to the economy being far lower if the nation can capture sizable gains from energy efficiency. Achieving these reductions at the lowest cost to the economy, however, will require strong, coordinated, economy-wide action that begins in the near future." The study's findings have been contested by energy industry experts, and its approach remains heavily scrutinized by academic economists.
[106] Nicholas Stern, *The Economics of Climate Change* (Cambridge: Cambridge University Press, 2007).

over how best -- both in environmental and economic terms -- to respond to climate change at the national and global levels.

Before turning to the presidential candidates' positions and policies, the next section will briefly introduce carbon taxes and cap-and-trade, which are the most widely-touted ways to regulate carbon dioxide emissions. Many assessments have been published evaluating the merits and demerits of these mechanisms.[107] This paper does not seek to reprise these. Instead, it aims to make note of the politics that have coalesced around each approach. The final chapter of this paper will discuss the foreign policy options open to the next administration and contours of a potential strategic U.S. global climate change policy.

Carbon Taxes and Cap-and-Trade: A Policy Consensus?

Within the U.S. domestic policy community, the discussion of policy responses to climate change has focused on two schools of thought: (a) taxing carbon via higher federal government fees (e.g. on retail gasoline); or (b) implementing a cap-and-trade regime that would establish a ceiling for carbon emissions and create a scarcity situation whereby industries would compete to buy permits to meet their carbon limits. These limits would become more rigorous over time.

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[107] Some include: *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World,Eds.* Joseph E. Aldy and Robert N. Stavins, (New York: Cambridge University Press, 2007); William D. Nordhaus, "To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming," *Review of Environmental Economics and Policy* 1, no. 1 (2007); Peter R. Orszag, "CBO Testimony: Statement of Peter R. Orszag, Director: 'Approaches to Reducing Carbon Dioxide Emissions' before the Committee on the Budget, U.S. House of Representatives," Congressional Budget Office, November 1, 2007; Bryan K Mignone, "International Cooperation in a Post-Kyoto World," *Current History* November 2007; Lee Lane, *Strategic Options for Bush Administration Climate Policy* (Washington, DC: American Enterprise Institute for Public Policy Research, 2006); Kevin A. Baumert, "The Challenge of Climate Protection: Balancing Energy and the Environment," in *Energy and Security: Toward a New Foreign Policy Strategy*, ed. Jan H. Kalicki and David L. Goldwyn, 485-508 (Washington, D.C.: Woodrow Wilson Center Press, 2005); David Victor, *Climate Change: Debating America's Policy Options* (Washington, DC: Council on Foreign Relations/Brookings Institution Press, 2004); Richard B. Stewart and Jonathan B. Wiener, *Reconstructing Climate Policy: Beyond Kyoto* (Washington, DC: American Enterprise Institute for Public Policy Research, 2003).

Supporters of a federal carbon tax argue that a tax would be more economically efficient than instituting a cap-and-trade regime, even if many Americans' opposition to a carbon tax could make a politician's vote in favor tantamount to political suicide. Advocates of a carbon tax include prominent economists, such as Professor William Nordhaus at Yale University, N. Gregory Mankiw at Harvard University, and Phil Verleger, senior advisor at the Brattle Group consulting firm. Both award-winning foreign affairs columnist Thomas Friedman and New York City Mayor and billionaire businessman Michael Bloomberg have spoken in favor of a carbon tax.

Advocates of carbon taxes above all cite what they perceive to be the greater efficiency benefits of a price-type approach over cap-and-trade regimes. (In contrast, proponents of a cap-and-trade regime, like that mentioned in the Kyoto Protocol or the nascent European carbon trading scheme, cite environmental urgency over economic surety, and point to the potential benefits of cap-and-trade -- such as utilizing market systems and creating myriad opportunities for new energy investments and carbon credits.) In a 2007 report, the Congressional Budget Office added its voice in favor of the efficiency that a carbon tax would entail, observing that:

> Although both a tax on emissions and a cap-and-trade system use the power of markets to achieve their desired results, a tax is generally the more efficient approach. The efficiency of a cap-and-trade program can be enhanced, however, through various design mechanisms, such as a 'safety valve' that would allow additional emission allowances to be sold when the price of an allowance exceeded a specified level.[108]

[108] Peter R. Orszag, "Statement of Peter R. Orszag, Director [Congressional Budget Office]:

Professor Nordhaus, who has written extensively on the carbon tax issue, argues that "price-type approaches such as carbon taxes have major advantages for slowing global warming."[109] He adds that using price approaches:

> […] has no international experience in the environmental area, although it has considerable national experience for environmental markets in such areas as the U.S. tax on ozone-depleting chemicals. On the other hand, the use of harmonized price-type measures has extensive international experience in fiscal and trade policies, such as with the harmonization of taxes in the EU and harmonized tariffs in international trade.[110]

Nordhaus continues:

> The latest calculation in the deterministic aggregate RICE model suggests that a 2010 carbon price of around $17 per ton carbon in 2005 prices—rising to $70 per ton in 2050—would efficiently balance the costs and benefits of emissions reductions, that is, maximize the present discounted value of benefits minus costs. It must be recognized that this estimate of the efficient carbon tax is unlikely to capture all the nonmarket aspects of global warming (such as effects on ecosystems), problems of uncertainty and risk aversion, and the potential for 'dangerous interferences' with many global processes. Nonetheless, it does

'Approaches to Reducing Carbon Dioxide Emissions' before the Committee on the Budget, U.S. House of Representatives," November 1, 2007. http://www.cbo.gov/ftpdocs/87xx/doc8769/11-01-CO2Emissions.pdf

[109] William D. Nordhaus, "To Tax or Not to Tax: Alternative Approaches to Slowing Global Warming," *Review of Environmental Economics and Policy* 1, no. 1 (2007): 26.

[110] Nordhaus, 29.

> describe a path that recognizes that countries care about their economic development as well as future costs of global warming.[111]

One of Nordhaus' important contentions seems to be that environmental protection must be balanced alongside concern for economic stability and growth -- an argument that, as he suggests, many countries have made during negotiations to create a post-2012 Kyoto regime.

Another frequent criticism leveled against cap-and-trade is that a traditional cap-and-trade system does not offer consumers protection against price increases. However, an auction-based system *might* mitigate that outcome if the federal government were to use income from auctioning credits for income tax relief and/or refunds to low-income citizens most affected by potentially higher energy prices. Other supporters of a price-type approach have said that, with time, taxing carbon will prove to be a sound national security measure. As economist Phil Verleger argued:

> We could have replaced the current payroll tax with a gasoline tax. Middle-class consumers would have seen increased take-home pay of between six and nine percent, even though they would have had to pay more at the pump. A stronger foundation for future economic growth would have been laid by keeping more oil revenue home, and we might not now be facing a recession.[112]

Mayor Bloomberg also has publicly endorsed a tax on carbon. In a November 2, 2007 speech, he said, "The certainty of a pollution fee -- coupled with a tax cut for all

[111] Nordhaus, 31.
[112] Thomas Friedman, "Coulda, Woulda, Shoulda." New York Times. November 14, 2007. http://www.nytimes.com/2007/11/14/opinion/14friedman.html

Americans -- is a much better deal" and "cap and trade is an easier political sell because the costs are hidden -- but they're still there […] the price volatility for carbon credits can discourage investment." The mayor cited the E.U. experience with carbon trading as an example. He also asked, "If all industries are going to be affected, and the worst polluters are going to pay more, why not simplify matters for companies by charging a direct pollution fee?" Bloomberg added that, "The primary flaw of cap-and-trade is economic -- price uncertainty; while the primary flaw of a pollution fee is political -- the difficulty of getting it through Congress." He also says that a "charge on pollution would be less regressive than the payroll tax, because the more energy you consume, the more you would pay."[113] Yet, even with the economic arguments in favor of taxing carbon, a price-type approach within U.S. domestic politics is a non-starter. For now, most Americans and the politicians they elect are not willing to support an explicit carbon tax, so the debate has centered upon a cap-and-trade regime.

To be sure, the most successful U.S. climate change legislation to date has involved a cap-and-trade system rather than a carbon tax. By backing a tax by virtue of its economic efficiency, carbon tax advocates find themselves arrayed against opponents who vociferously champion a cap-and-trade regime, such as Eileen Claussen of the Pew Center on Global Climate Change, who has said:

> One pathway, to be sure, is the one charted by Kyoto: binding emissions targets coupled with emissions trading. Emission targets provide environmental certainty -- everyone knows by just how much emissions are to be reduced -- while emissions trading harnesses market forces to deliver those reductions at the lowest

[113] Michael R. Bloomberg, "Mayor Michael R. Bloomberg Delivers Keynote Address at the United States Conference of Mayors Climate Protection Summit—Accelerating Local Leadership," Office of the Mayor, November 2, 2007. www.nyc.gov.

> possible cost […] As the World Bank recently concluded, targets and trading is [sic] also critical because it is by far the likeliest means of generating the multi-billion dollar investments needed to drive down emissions in fast-growing developing countries.[114]

Many cap-and-trade proponents have argued for an auctioned system in which credits are not given away for free. They also claim both that taxes cannot guarantee specific levels of emissions reductions and that a carbon tax would require frequent modification to meet environmental goals. Moreover, advocates for quantitative limits for the United States tend to oppose the European Union's initial approach of "grandfathering" credits to industry based on historic emissions; this can lead to problems, e.g. conferring windfall profits. In theory, an auctioned-based regime would: (a) limit pollution and push reductions in emissions; (b) raise revenue for alternative energy research; (c) re-allocate revenue to help poor and middle-income households most-affected by energy price increases; (d) utilize the market to seek cost-efficient solutions more quickly; and (e) support competition by clean energy.

Industry groups that have called for action on climate change have favored a cap-and-trade approach. Of these, the most prominent is USCAP, which -- rather strikingly -- includes corporations such as Duke Energy, ConocoPhillips, and Shell, and environmental groups such as the Natural Resources Defense Council (NRDC), Environmental Defense, and the National Wildlife Federation. USCAP's mission statement includes the point that "USCAP is an expanding alliance of major businesses and leading climate and environmental groups that have come together to call on the

[114] Eileen Claussen and Elliot Diringer, "A New Climate Treaty: U.S. Leadership After Kyoto," *Harvard International Review* 29:1 (2007).

federal government to enact legislation requiring significant reductions of greenhouse gas emissions."[115] In addition, as previously mentioned, ICAP also supports an eventual transnational, linked system of carbon credit trading:

> ICAP will provide an international forum in which governments and public authorities adopting mandatory greenhouse gas emissions cap and trade systems will share experiences and best practices on the design of emissions trading schemes. This cooperation will ensure that the programs are more compatible and are able to work together as the foundation of a global carbon market.[116]

For the near future, the cap-and-trade/quantitative approach seems to be the overwhelming trend at the international level -- E.U. member countries' high gasoline taxes notwithstanding.

Instituting a cap-and-trade program involves many complexities such as, whether or not to auction credits, how to do so, and over what length of time; the question of managing potential price volatility (there are many disagreements about how to mitigate that) coupled with the "promise" of emissions certainty; and, how to avoid the possibility of "leakage" where industries could relocate to areas with less stringent requirements. These are issues that some, but not all, of the presidential candidates address in their proposals to mitigate climate change. Finally, the Bali action plan process, initiated at the end of the U.N. Climate Change Conference in 2007, will reach its midpoint in December 2008 -- just before the next president of the United States takes office.

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[115] http://www.us-cap.org/

[116] "Nations, States, Provinces Announce Carbon Markets Partnership to Reduce Global Warming," Press Release, International Carbon Action Partnership, October 29, 2007. http://www.icapcarbonaction.com/pr20071029.htm

VI. THE 2008 PRESIDENTIAL CAMPAIGN: A TURNING POINT?

The leading 2008 presidential candidates have stated that climate change is a problem. Some have charted detailed policies to tackle it. The candidates' policy prescriptions range from implementing a national cap-and-trade system to a focus on energy security or "energy independence", including investments in renewable energy both to reduce foreign oil dependence and lessen GHG emissions. A number have backed funding that the Bush administration has not allocated to operationalize the Advanced Research Projects Agency (Energy), modeled on the Department of Defense's own Defense Advanced Research Projects Agency, DARPA.[117] A few candidates have described their vision for a new energy strategy in terms of an Apollo or Manhattan Project. Energy and the environment, including climate policy, remain important if not pivotal issues in the 2008 election. The future directions for America's climate change diplomacy will be discussed in the next chapter.

Domestic Policy Initiatives

All the leading presidential candidates have put forth significant climate policy proposals. Senator Hillary Clinton (D-NY) and Senator Barack Obama (D-IL), as well as former Senator John Edwards (D-NC) -- who left the race at the end of January 2008 -- adopted wide-ranging climate change plans including cap-and-trade. On the Republican side, Senator McCain has supported cap-and-trade; former Massachusetts Governor Mitt Romney and former New York City Mayor Rudolph Giuliani opposed it. There were major differences between Senator McCain's proposal for a national cap-and-trade system and Governor Romney's plan for energy security, where reductions in greenhouse gas emissions would be a beneficial by-product of reducing the American economy's

[117] ARPA-E was authorized by the *America Competes Act* (2007) which President George W. Bush signed.

dependence on oil. Explaining his position in religious terms of stewardship over creation, former Arkansas Governor Mike Huckabee said that he could support a cap-and-trade system but did not detail his thinking on the issue. Only Independent candidate Ralph Nader has advocated a carbon tax.

Democratic contenders Hillary Clinton and Barack Obama, and the likely Republican nominee John McCain, have endorsed a U.S. cap-and-trade system. The Democratic candidates' proposals are rather similar. The Clinton and Obama plans would auction 100 percent of allowances and seek an 80 percent reduction in CO_2 emissions by 2050. Both Senators Clinton and Obama would double federal spending on clean energy research and development. Senator Obama has endorsed the development of a national low-carbon fuel standard as well.[118]

For his part, Senator McCain co-sponsored a Senate bill that called for capping emissions 65 percent by 2050, notably less than the Democrats' 80 percent by 2050 proposal. McCain has not yet committed to a 100 percent auction-based allocations system. At the *Wall Street Journal's* "Eco-nomics" conference in March 2008, McCain's energy adviser Douglas Holtz-Eakin stated that a 100 percent auction is a "blackboard exercise" and that industries have "different historical costs" and "different ability to pass costs on to consumers." Holtz-Eakin did not specify what mix of free allocation and auctioned credits McCain would support if elected president.[119]

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[118] The standard proposed by Senator Obama would require fuel suppliers to reduce carbon emissions from fuels that they produce by a rate of 10 percent by 2010. "Barack Obama: Promoting a Healthy Environment" and "Environmentalists for Obama," February 2008, http://my.barackobama.com/page/content/envirossupport/

[119] David Roberts, "Eco:nomics: Presidential energy advisors: Campaign energy wonks clarify candidates' differences on climate change," *Grist*, http://gristmill.grist.org/story/2008/3/14/221425/110/ March 15, 2008 (Accessed March 17, 2008). Link includes video of panel presentations by 2008 presidential campaign advisers on energy issues.

Senator McCain's cap-and-trade plan is a significant break with Republican Party orthodoxy.[120] While the McCain campaign's website gives few details about the senator's climate change plans, it states that he "has been a leader on the issue of global warming with the courage to call the nation to action on an issue we can no longer afford to ignore." The senator's legislative record is more instructive. A 2003 bill, the "Climate Stewardship Act," which Senator McCain sponsored with Senator Lieberman garnered 43 votes -- not enough to pass, but far more than expected.

Subsequently, Senator McCain has frequently introduced updated versions of the "Climate Stewardship and Innovation Act," which would cut emissions 15 percent by 2020 and 65 percent by 2050. [121] McCain has come to strongly support nuclear power, incurring the ire of some environmentalists who supported his 2003 bill. A 2005 version of McCain and Lieberman's "Climate Stewardship Act" failed 38-60 in the Senate. In large part, the bill failed with even fewer votes than in 2003 because of Senator McCain's insistence on adding subsidies for nuclear power into the bill.[122] (In recent years, other bills, namely the Lieberman-Warner "Climate Security Act" and the Bingaman-Specter "Low Carbon Economy Act," have garnered greater attention.) Holtz-Eakin has stated

[120] In a February 28, 2008 town hall meeting at Rice University, Senator McCain said, "Suppose that we who believe that climate change is taking place are wrong, and we go ahead and develop these green technologies, whether it be hybrid cars, hydrogen, whether it be flex fuels, whether it be nuclear power, whether it be sun, tide, solar -- all of the ways of generating power and reducing and eventually eliminating greenhouse gas emissions. Suppose that we do that. All we've done is given our children and grandchildren a cleaner planet. Suppose we are correct, as is the majority of scientific opinion that greenhouse gases are causing significant and severe damage to the climate of our planet, and we do nothing […] So we really need to, I believe, make the American people aware what is at stake here with the nexus of these two, I think, compelling issues for the 21st century."

[121] Senator McCain's website adds that he "has offered common sense approaches to limit carbon emissions by harnessing market forces that will bring advanced technologies, such as nuclear energy, to the market faster, reduce our dependence on foreign supplies of energy, and see to it that America leads in a way that ensures all nations do their rightful share."

[122] David Corn, "McCain's Nuclear Waste: How the Arizona Senator Doomed His Own Global Warming Legislation with Billions in Nuclear Subsidies" *Mother Jones*, March 4, 2008. http://www.motherjones.com/washington_dispatch/2008/03/john-mccain-nuclear-waste.html (Accessed March 17, 2008).

that Senator McCain would support cap-and-trade as a regulatory strategy, but he would not attempt to "micromanage" the economy and seek expansive federal standards on fuel economy, efficiency, and renewable energy.

By comparison, many of Senator McCain's opponents during the 2008 Republican presidential primary contest opposed, or sidestepped, regulation of carbon dioxide emissions. Instead, most of McCain's competitors favored increasing domestic energy production (oil, natural gas, coal, and nuclear) and reducing American dependence on foreign oil. For example, former Governor Romney staunchly backed domestic energy production and technological innovation -- for national security, not climate protection. His *Strategy for a Stronger America* proclaimed that "our military and economic strength depend on our becoming energy independent -- moving past symbolic measures to actually produce as much energy as we use […] at the same time, we may be able to rein in our greenhouse gas emissions."[123] While the former governor's position represents a strongly held viewpoint within the Republican Party, Senator McCain's more activist approach has gained traction, for now.

Diplomatic Initiatives

Thus far, Senators Clinton, Obama, and McCain have supported reinvigorating American diplomacy with the task of crafting a climate accord that includes commitments from all major emitting economies.[124] The Democrats have more readily expressed a desire to re-engage with the UNFCCC process in order to create a successor

[123] Mitt Romney, "Strategy for a Stronger America," 29, www.mittromney.com

[124] For further reading see: "Powering America's Future: Hillary Clinton's Plan to Address the Energy and Climate Crisis," at www.hillaryclinton.com; "Barack Obama: Promoting a Healthy Environment," at www.barackobama.com; "A New Energy Economy," at www.johnedwards.com; "Stewards of Our Nation's Rich Natural Heritage," at www.johnmccain.com; "Strategy for a Stronger America," page 29, at http://www.mittromney.com/img/pdf/SSA/Romney_StrongerAmerica_Booklet.pdf; "Energy Independence" at www.mikehuckabee.com; and "Energy Independence," at www.joinrudy2008.com.

to the Kyoto Protocol. Senator Clinton has even audaciously proposed implementing a new treaty by 2010 -- two years before the official lapse of the Kyoto Protocol -- if major emitters can be brought onboard. Of the Republicans, Senator McCain spoke out most strongly in favor of international engagement.

The climate policy platforms of the three leading presidential candidates suggest that the inclusion of developing country commitments in a post-Kyoto treaty is a prerequisite for U.S. participation. All have supported consultations among a major emitting economies group -- in conjunction with the UNFCCC process -- to build consensus (which President Bush started at the end of 2007). The main focus of the group is to forge agreement on a new climate treaty's key elements: participation by all major emitters, technology research and transfer, and enforcement, measurement, and verification. Regarding adaptation abroad, Obama's plan calls for technology-transfer assistance for developing countries to help them fight climate change.

Table 3. Presidential Candidates on Climate Change[125]

	Emissions Reduction Target	**100% C-T Credit Auction**	**Higher CAFE Standards**	**Renewable Energy Standard**	**Offshore Drilling**
Clinton	80% by 2050	Yes	40 mpg by 2020 55 mpg by 2030	25% by 2025	No
Obama	80% by 2050	Yes	52 mpg by 2026	25% by 2025	No
McCain	60% by 2050	Mixed. Auction proportion will increase gradually.	In principle; specifics unclear.	Supports state but not U.S. targets.	States should decide.
Romney	Global not national	---	No	N/A	Yes
Huckabee	In principle	Not Articulated (N/A)	35 mpg by 2020	15% by 2025 with clean coal, nuclear	N/A

[125] Sources: The League of Conservation Voters (LCV) 2008 Primary Voters Guide http://www.lcv.org/voterguide/ and http://www.grist.org/feature/2007/07/06/candidates/.

Today, the key question is: could the next American president accept an international emissions cap-and-trade regime and under what conditions? From a U.S. point of view, analysts tend to: (a) dismiss the Kyoto Protocol as it currently exists in favor of other options; (b) accept the protocol as a starting point upon which to improve; and (c) pick and choose certain elements of the protocol for a completely different regime. To some, the Kyoto Protocol's "reliance on cost-saving international emissions trading remains the most promising path to climate protection" but improvements can be added.[126] However, it is likely that the United States will not join the Kyoto Protocol but work to fashion a successor agreement tailored to American preferences -- which have gradually moved closer to, but have not yet merged with, international, especially E.U., norms on mitigation.

It is improbable that a new president could successfully guide ratification through the U.S. Senate of a new climate treaty that imposes mitigation commitments, such as emissions limits, on the United States without requiring mitigation actions from developing countries. Given the experiences of President Clinton and Vice President Gore during the 1990s, neither the American people nor their elected representatives will be likely to accept a new climate treaty that does not include China and India, for example. "Without some participation by low-cost countries, there is no agreeable way for high-cost countries to pay for reductions where they are needed (and can be afforded)

[126] Kevin A. Baumert, "The Challenge of Climate Protection: Balancing Energy and the Environment," in *Energy and Security: Toward a New Foreign Policy Strategy*, ed. Jan H. Kalicki and David L. Goldwyn, 485-508 (Washington, D.C.: Woodrow Wilson Center Press, 2005), 485.

most."[127] On the other hand, without U.S. leadership and adaptation assistance, the likelihood of developing country participation in a new climate treaty is very low.

Reaching a consensus first among major emitting countries (industrial and industrializing alike) may be more efficient than trying to forge an initial consensus among all countries party to the UNFCCC process. Indeed, one school of thought contends that, "The United States should engage China (and other major developing countries) in a parallel regime and then jointly seek to enter a suitably modified version of the Kyoto Protocol."[128] In fact, President Bush began a dialogue among major emitting economies at the end of 2007. His successor should not miss the opportunity to provide new legitimacy and direction for this important initiative. The United States is more likely to join a new climate treaty if it is global in scope and, at least, covers all major emitters.

Adaptation and Innovation: Towards a Green Energy Economy?

Slow but steadily rising attention is being paid towards the development of a robust green energy economy in the United States. The energy proposals of Senators Clinton and Obama address adaptation and innovation, in addition to putting a price on carbon. Senator Clinton's statement on energy and the environment observes that the senator "has an aggressive plan to address global warming, but she also recognizes that global warming is already occurring, and that we need to begin to prepare for global warming impacts that are on the horizon."[129] Senator Obama would "[…] create a

[127] Sheila M. Olmstead, "The Whole and Sum of Its Parts" (commentary) in Joseph E. Aldy and Robert N. Stavins, eds, *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World* (New York: Cambridge University Press, 2007), 177.
[128] Richard B. Stewart and Jonathan B. Wiener, *Reconstructing Climate Policy: Beyond Kyoto* (Washington DC: American Enterprise Institute Press, 2003), 6.
[129] Hillary R. Clinton, "Powering America's Future: Hillary Clinton's Plan to Address the Energy Climate Crisis," www.hillaryclinton.com (Accessed 30 January 2008).

Technology Transfer Program within the Department of Energy dedicated to exporting climate-friendly technologies, including green buildings, clean coal and advanced automobiles, to developing countries to help them combat climate change."[130] Credible adaptation assistance could be an important incentive to secure developing country participation in a new international treaty.

At home, under a new president, policymakers may begin to consider ways in which coastal communities can adapt to climate change impacts more effectively. "Policy debate and advocacy on the issue of climate change frequently focus on the potential future impacts of climate on society, usually expressed as economic damage or other human outcomes. But it is well understood that the societal impacts of climate are a joint result of climate phenomena (e.g. hurricanes, floods, and other extremes) *and* societal vulnerability to those phenomena (e.g. Mileti, 1999)."[131] After Hurricanes Katrina and Rita revealed the derelict state of Louisiana's flood-control infrastructure in 2005, reducing vulnerability to extreme weather has indeed become a more important public policy issue as well as a potential economic growth opportunity.

Both Senators Clinton and Obama have proposed multibillion dollar investments to fund a transition to a less-carbon intense economy. Senator Clinton would create a U.S. $50 billion Strategic Energy Fund, partially funded by oil companies, to help invest in renewable energy. The fund would form one-third of a total of U.S. $150 billion investment in clean energy over ten years. Senator Obama also has committed to investing U.S. $150 billion in alternative and renewable energy over 10 years. Both

[130] "Barack Obama: Promoting a Healthy Environment," at www.barackobama.com. (Accessed February 1, 2008).
[131] Roger A. Pielke, Jr, and Daniel Sarewitz, "Bringing Society Back into the Climate Debate," *Population and Environment* 26 (3), January 2005: 255-268, p. 257.

senators' plans would support the commercialization of plug-in hybrid vehicles, commercial scale renewable technologies, low emissions coal power plants, and modernization of the electricity grid. The Apollo Alliance, "a coalition of business, labor, environmental, and community leaders" advocating for public policies that support the renewable energy sector, has estimated that annual investments of U.S. $30 billion over 10 years could create as many as 3.3 million new jobs, add U.S. $1.4 trillion in GDP, and produce U.S. $284 billion in energy savings.[132] To this end, U.S. Senator Debbie Stabenow (D-MI) successfully added U.S. $3.5 billion for a "Green Collar Jobs Initiative" in the Senate budget bill for fiscal year 2009.[133]

One caveat must be made, though. The two Democratic candidates' plans may be too ambitious to be passed in their current forms. They will likely encounter stiff resistance from industry opponents. In practice, the senators' plans might well be scaled back by Congress along more modest lines -- at least initially -- perhaps bringing them closer to Senator McCain's May 2008 proposal of 60 percent reduction under 1990 levels by 2050. In sum, climate change will not be the issue that decides the 2008 presidential election, but it has never been as significant an issue in U.S. politics as it is today.

[132] "New Energy for America: Apollo Jobs Report" (Executive Summary), Apollo Alliance, January 2004, http://www.apolloalliance.org/jobs.php. For further reading, see: Jay Inslee and Bracken Hendricks, *Apollo's Fire: Igniting America's Clean Energy Economy* (Washington, D.C.: Island Press, 2008).
[133] See: Press Release, "Stabenow: Senate Budget Creates Jobs, Invests in the Middle Class," March 6, 2008, http://stabenow.senate.gov/press/2008/030608budgetrelease.htm (Accessed March 26, 2008).

VII. A STRATEGIC U.S. POLICY ON GLOBAL CLIMATE CHANGE?

"We face more than simply a scientific problem. It is also a diplomatic problem of when and how we take action."

-- *Secretary James A. Baker III*[134]

As a policy issue, climate change has arrived. Following publication of the 2007 IPCC Report, the real point of contention in U.S. policy circles today is not whether the science is right but rather what implications should be drawn from the science. The January 2008 final report of the Secretary of State's Advisory Committee on Transformational Diplomacy observed that, "The United States must lead the formation of new international law, standards, and practices in emerging areas such as climate change, genetics and nanotechnology."[135] Yet, with respect to climate change, it has not done so. As a result, the next president "will face a major decision on how (or whether) to reengage in international efforts to protect the climate system."[136] In this sense, the outcome of the 2008 presidential election will have a defining influence on the future of U.S. climate policy.

If the United States needs to demonstrate leadership on climate change policy, many questions still remain about what kind of leadership to exercise. What foreign policy strategies could the new U.S. president choose from? What would a genuinely strategic U.S. climate change policy look like at the global level? Under what

[134] Remarks by Secretary Baker before the Response Strategies Working Group of the Intergovernmental Panel on Climate Change at the U.S. Department of State on January 30, 1989.
[135] U.S. Department of State, "Final Report of the Secretary of State's Advisory Committee on Transformational Diplomacy," January 2008, p. 6. Available at: http://www.state.gov/documents/organization/99903.pdf
[136] Kevin A. Baumert, 492.

circumstances might the U.S. government support an international regime with binding emissions limits? Finally, does U.S. policy include an equitable focus on both mitigation and adaptation?

Since the United States continues to be one of the largest GHG emitters, American involvement in a new international climate change regime will be a powerful determinant in that regime's success or failure. U.S. accession to a global climate regime could also have major repercussions for the American economy. If the United States reengages, climate change will almost certainly become a significant, perhaps key issue in both domestic and foreign policy. The central premises of this chapter are, first, that the next president will reevaluate America's climate policy options and, second, that U.S. foreign policy on climate change will be shaped in large part by domestic politics.

The Challenge for the Next President: Bali and Beyond

Climate change may be America's most difficult collective action challenge. Its effects will be distributed inequitably around the world on a multigenerational scale. It is a problem that "requires international cooperation at a scale to which we are not accustomed" with "a longer time horizon than with respect to any other public policy problem."[137] In a sense, that is only the beginning. According to the International Energy Agency, the world's energy consumption will grow 55 percent by 2030, with fossil fuels providing an estimated 84 percent of the world's energy sources. Economic growth in developing countries will drive this increase and fuel major new carbon dioxide emissions under a business as usual scenario.[138] The energy system upon which the

[137] Lawrence Summers, "Foreword," in *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World*, eds. Joseph E. Aldy and Robert N. Stavins (New York: Cambridge University Press, 2007), 2, 4.
[138] *World Energy Outlook*, International Energy Agency, 2007, 42-52.

modern global economy relies will have to be transformed in many respects to meet the goal of climate mitigation and eventual stabilization.[139]

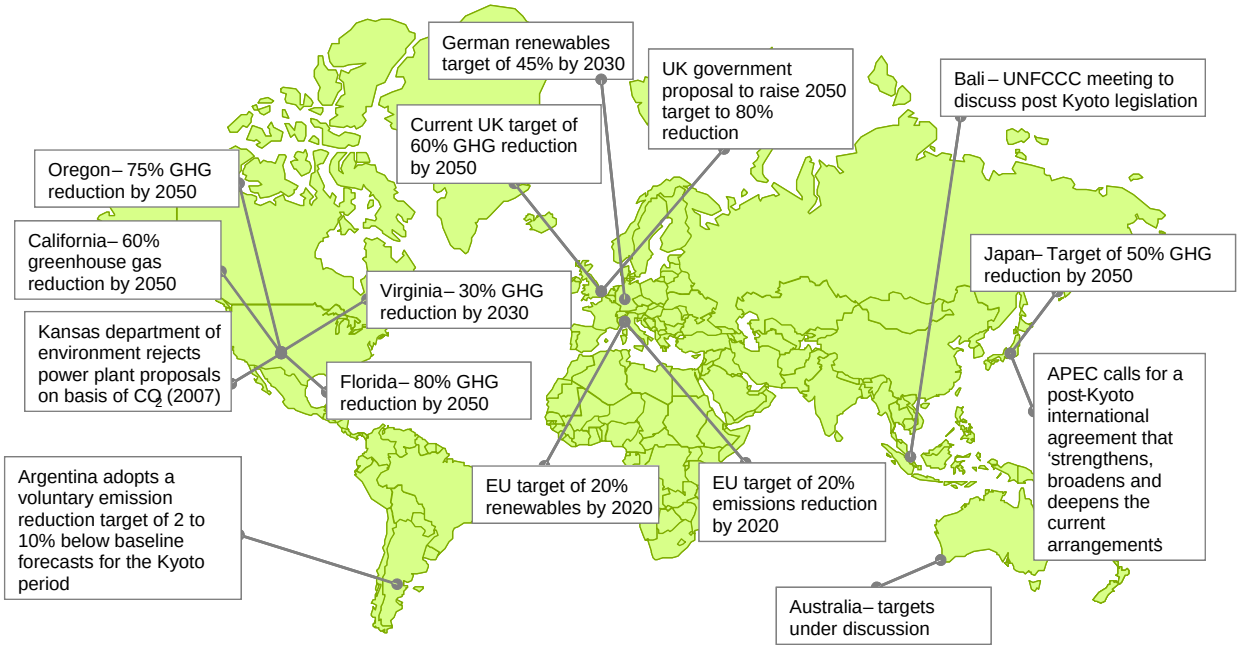
While U.S. policymakers have struggled to devise a policy response to climate change, America's international allies and partners have moved ahead. The European Union has set a target of 20 percent renewable energy use by 2020; the E.U. also seeks to cut emissions one-fifth by 2020. Under its proposed action plan, the European Commission would auction 60 percent of permits for the European Trading System (ETS) in 2013 (compared to 10 percent in 2007) and increase the percentage of auctioned permits over time. The British government has a current target to reduce emissions 60 percent by 2050 with a possible upward revision to a total 80 percent reduction. Japan has called for global emissions reductions of 50 percent by 2050. The Japanese government has also announced plans to study a mandatory, national cap-and-trade system to regulate GHG emissions.

In Australia, Prime Minister Kevin Rudd has overturned a decade of conservative climate change policies. The Rudd government has proposed major climate legislation, including binding emissions targets, and national renewable energy standards. The February 2008 interim report of an Australian study on the economics of climate change -- commissioned by Australia's state and territorial governments and prepared by Australian National University economist Ross Garnaut -- favors 100 percent auction of carbon emissions trading credits.[140] In Canada, the government of British Columbia enacted a revenue-neutral carbon tax to take effect on July 1, 2008. Covering all fossil fuels, the tax rate starts at C$10 per ton of carbon dioxide. It will rise by nearly C$5 per

[139] Baumert, 489.
[140] http://www.garnautreview.org.au/

year until 2012.[141] As other countries prepare the way for green economies, America is in danger of being left behind.

Figure 3. International Initiatives



Source: Accenture

During 2008 and 2009, U.S. international climate change policy will be influenced by the action plan agreed upon at the December 2007 U.N. Climate Change Conference in Bali, Indonesia. The action plan will guide negotiations to design an agreement to succeed the Kyoto Protocol, which will expire in 2012. The Bali action plan says that "deep cuts in emissions will be required" but does not specify any quantitative targets.[142] The action plan calls on both developing and developed countries to take steps

[141] "B.C. Introduces Carbon Tax, But Off-sets Increased Fuel Costs with Tax Cuts," *Canadian Press*, February 20, 2008, http://canadianpress.google.com/article/ALeqM5jgHEtIZZYeVxdEQy1WWvRHUabAww (Accessed 2/20/08).
[142] "Bali Action Plan," Executive Secretariat of the United Nations Framework Convention on Climate Change, December 14, 2007. http://unfcccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf

to mitigate climate change. The plan puts the onus on industrialized countries to provide financial, technical, and logistical aid for adaptation in exchange for mitigation actions by industrializing countries.[143]

Other notable aspects of the action plan include: "policy approaches and positive incentives" to reduce deforestation, which accounts for an estimated 20 percent of global carbon emissions; enhanced action on adaptation; and "enhanced action on technology development and transfer to support action on mitigation and adaptation."[144] For its part, the United States successfully defeated an attempt led by the European Union to write emissions reduction targets into the final document. The E.U. had sought targets of 40 percent by 2020 (at 1990 baseline) and 50 percent by 2050. Though criticized as "a vapid statement of good intentions," the Bali action plan has set the tone of the negotiations for a new international climate accord.[145]

The next American president will be able to choose from a number of strategies.[146] The most notable are: (a) global leadership, actively seeking to shape global climate governance and promote clean energy solutions to meet U.S. as well as international goals defined by the UNFCCC; (b) passive participation, engaging in negotiations but eschewing a leadership role; (c) domestic unilateralism, pursuing a domestic policy first and building a foreign policy approach upon that; (d)

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[143] The Bali Action Plan specifically calls for non-binding "nationally-appropriate **mitigation actions** by **developing** country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity building, in a measurable, reportable, and verifiable manner" [emphasis added]. It also includes pledges of "measurable, reportable and verifiable nationally-appropriate **mitigation commitments or actions**, including quantified emission limitation and reduction objectives, by all **developed** country Parties, while ensuring the comparability of efforts among them, taking into account differences in their national circumstances" [emphasis added].

[144] Bali Action Plan.

[145] "Some Like It Cool," *The Economist*, December 19, 2007 http://economist.com/opinion/displaystory.cfm?story_id=10335267

[146] For further reading, see: David Victor, *Climate Change: Debating America's Policy Options* (Washington, DC: Council on Foreign Relations/Brookings Institution Press, 2004).

obstructionism, actively opposing global climate governance to achieve maximum policy flexibility; and, (e) neutral observation, essentially a "wait and see" approach. Of course, a single policy can include nuanced varieties of these ingredients.

One quite possible mixed approach, at least in the short-term, could be called "convergence." Key here would be building a consensus on domestic measures (including cap and trade, for instance) roughly consistent with international efforts. In time, this would presumably permit the United States more easily to join an international regime. Building a domestic consensus is vital.

For example, during the Clinton presidency, the U.S. took a leading if contentious negotiating position on the Kyoto Protocol, and the United States successfully fought for the inclusion of market mechanisms to operationalize the protocol.[147] However, the Clinton administration's relative exercise of global leadership ignored the lack of domestic support for the treaty. President Clinton's experience suggests that "the executive has significant leeway to negotiate on behalf of the country; however, climate policy will require domestic policy changes that demand broad political support to enact them."[148] President Clinton lacked such support and his policy failed without it. Today, there is an enormous opportunity for the United States to develop a strong green energy sector, in tandem with a robust climate change mitigation strategy.

A U.S. approach which promotes both technological innovation to create cleaner energy sources and less carbon-intense modes of transportation and market-based mechanisms to regulate carbon would be comprehensive but not risk-free. Still, a strategy that seeks consensus at home and cooperation -- leading to convergence -- abroad is

[147] Baumert, 494-495.
[148] Cass, 8.

necessary to break the climate Catch-22. The United States needs a strong foundation of domestic political support upon which to negotiate an effective global regime that will both reduce carbon dioxide emissions and meet critical U.S. economic interests. Conversely, in the event that the U.S. government enacts a domestic regime prior to joining a global climate accord, the United States risks economic disadvantage in the form of the "carbon leakage" problem, if rapidly growing developing countries do not take similar measures. A final point here is that the rigidity that characterizes some policy strategies to-date, i.e., in terms of a "top-down" international regime or a "bottom-up" domestic incrementalism, is probably misplaced.[149] A comprehensive U.S. climate policy would involve creating domestic consent for international leadership -- a difficult but by no means impossible task.

The Future of U.S. Climate Change Policy

The 2008 presidential candidates from both parties have proposed major legislative agendas to tackle the climate challenge on a scale never seen before. In addition, recommitting the United States to a constructive climate policy is a key component of those plans. Moreover, contrary to the design of the Kyoto Protocol, "in the context of regulating GHG emissions, some countries do matter more than others."[150] The Bush administration has already begun consultations with major emitting countries. Working to reduce deforestation and natural gas flaring also are important steps for both major emitters and oil producing countries to take. We expect that the next president will continue and enhance these discussions to bring clarity and unity of purpose to the main UNFCCC process.

[149] Mignone, 363.
[150] Olmstead, 174.

The authors also contend that, in addition to analyses that examine emissions targets and cost-effectiveness, it is critical to also bear in mind the role of national interests, mechanisms of global governance, and international institutions in forging a climate policy consensus. In this respect, the authors agree with David Victor and Carlo Carraro that "[…] the design of any future agreement on climate policy must start from analyzing each country's incentives to participate in the agreement, and then move to identify policy instruments and institutions that provide adequate incentives to reluctant countries."[151] Considering this set of circumstances, it is highly likely that, given the candidates' records and statements, as well as public opinion, the next U.S. president will favor a hybrid strategy of regulation at home and negotiation abroad: a strategy that builds a domestic system to regulate carbon dioxide emissions gradually, while pushing at the international level for a new, comprehensive climate treaty.

What are the advantages and liabilities in the international political arena if the United States pursues a domestic-first strategy in support of an eventual global accord? While there is not enough space here to provide a detailed examination, a few key points will be mentioned. Significant U.S. steps to speed up technological innovation and carbon regulation, as well as to provide adaptation assistance to developing countries, will likely be welcomed by most countries. U.S. support for a "multitrack" approach could garner widespread support among countries looking to make varying sorts of commitments:

> The types of policies that can effectively address greenhouse emissions in a manner consistent with national interest will by necessity vary from country to

[151] Carl Carraro, "Commentaries on Victor: Incentives and Institutions: A Bottom-Up Approach to Climate Policy," *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World*, in Joseph E. Aldy and Robert N. Stavins, eds, (New York: Cambridge University Press, 2007), 161.

> country. To achieve broad participation, a framework for multilateral climate action must therefore be flexible enough to accommodate different types of national strategies by allowing for different types of commitments. It must enable each country to choose a pathway that best aligns the global interest in climate action with its own evolving national interests.[152]

A flexible yet integrated approach may hold considerable appeal among the U.S. electorate, compared to the top-down approach of the Kyoto Protocol or unilateral action divorced from international engagement. However, a U.S. strategy which that focuses on a new climate treaty may irritate European allies, which would like to see the United States join existing efforts, embodied by the Kyoto Protocol. A U.S. initiative focused domestically, at least at first, could be viewed as woefully inadequate to meet the global scope of climate change. The E.U. will be keen to see a U.S. cap-and-trade regime in place that could eventually be linked in some form with the ETS. At the same time, developing countries are unlikely to accept binding emissions limitations unless the U.S. government takes action, too. Even so, emissions mitigation actions by major developing countries are essential to tackle the climate challenge.

China is a notable example: any U.S. strategy to lead on climate change must involve increasingly robust Chinese participation to be effective. "An astonishing 58% of the global increase in emissions in the six years to 2006 came from China and 6% from India […] However, as for energy demand, per-capita emissions remain about one-third

[152] "International Climate Efforts Beyond 2012: Report of the Climate Dialogue at Pocantico," Pew Center on Global Climate Change, November 15, 2005. Available at: http://www.pewclimate.org/global-warming-in-depth/all_reports/climate_dialogue_at_pocantico/

below OECD levels."[153] Retrofitting China's (or America's) coal-power plants for carbon-capture and sequestration will be a massive undertaking -- assuming the technology becomes viable. Increased use of natural gas for electricity generation in China would be environmentally beneficial but raises many questions concerning pricing, supply, and geopolitical strategy.[154]

Without U.S. cooperation, China's leaders will be loath to sacrifice economic growth for environmental gains.[155] "With its ongoing economic growth, China will inevitably be confronted with growing energy use and CO_2 emissions. Therefore, GHG mitigation will pose a significant challenge to the country to maintain a sustainable development."[156] Current projections suggest that China will account for more than 25 percent of global greenhouse gas emissions by 2030.[157] Changing over both countries' heavily fossil-fuel-dominated power sectors to cleaner energy sources quickly enough to stabilize emissions with only a 2 or 3 degree Celsius temperature rise is a daunting challenge -- but one that American ingenuity is capable of tackling.

Another central component of any global climate change policy is compliance. For an issue as complex as climate change, how do countries enforce their agreements to reduce emissions, verify compliance, and measure the effectiveness of their actions? It is difficult to envision a new climate change treaty that imposes truly effective punitive

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[153] *World Energy Outlook 2007*, 55.
[154] See: D. Victor, A. Jaffe, and M. Hayes, eds., *Natural Gas and Geopolitics: 1970-2040* (Cambridge: Cambridge University Press, 2007); and Victor, *Architectures for Agreement*, 157.
[155] A 10- year collaboration between China and the USA on energy and the environment was announced at the Third U.S.-China Strategic Economic Dialog (December 12-13, 2007) in Beijing, China. Details will be planned by a working group, according to the U.S. Government announcement (fact sheet).
[156] Xiaojie Xu, et al, "Chinese Policies on Climate Change and Environment Protection," Baker Institute 2008.
[157] David Victor, "Hot Air," *Newsweek*, December 2, 2007, http://www.newsweek.com/id/73158

measures for non-compliance other than trade penalties. Of the presidential candidates, former U.S. Senator Edwards addressed this issue most directly:

> Any climate change treaty must include developing countries, which emit significant amounts of carbon and could otherwise serve as a haven for polluters. However, these nations are poorer than the U.S. and emit far less carbon per capita. To bring them to the table, Edwards will share America's clean energy technology in exchange for binding greenhouse reduction commitments. **If necessary, he will insist that strong labor and environmental standards in our trade deals include commitments on climate change.** This new deal will require global participation, promote shared responsibility, and let American workers and businesses compete on a level playing field [emphasis added].[158]

In the event that a major emitting country refuses to cut emissions, or falls behind on its reduction commitments, the application of carbon tariffs is conceivable but potentially inflammatory.

In a paper for the Pew Center on Global Climate Change, Daniel Bodansky and Elliot Diringer wrote that, among compliance measures, in addition to "naming and shaming," expert and technical advice to correct inefficiencies, and denial of access to international emissions trading, "Other possibilities include financial penalties and trade measures against non-participating or non-complying states, such as border tax

[158] "A New Energy Economy," John Edwards for President http://www.johnedwards.com/issues/energy/new-energy-economy/ (accessed February 5, 2008).

adjustments or countervailing duties."[159] These would still be bold measures to enforce an environmental agreement and could raise prices for U.S. consumers.[160]

U.S. Trade Representative Susan Schwab has criticized the tariff provision in the Lieberman-Warner bill. In a written statement, Schwab said that "Attempting to force others to act on climate change through trade saber-rattling carries enormous risks. These threats to the global trading system cannot be ignored or glossed over."[161] The United States, though, is not the only country to consider tariffs as part of its approach to climate change policy.

The European Union seems disinclined to enact carbon tariffs -- for now. E.U. Environmental Commissioner Stavros Dimas has criticized a provision in the Lieberman-Warner bill that would place a tariff on imported goods from countries without GHG regulations. During a visit to Washington, D.C. in early 2008, Dimas said that a tariff would be unnecessary if a global agreement is reached in 2009, but added that the E.U., too, might consider one in case an agreement is not in place by 2011. The U.N.'s climate change chief, Yvo de Boer, has said that if the E.U. were to enact its own carbon tariff, "developing countries would see that as acting in bad faith" and such a tariff would be "basically a border tax."[162] Nonetheless, Joseph E. Stiglitz (2006) has supported the concept of a border tax by the E.U., Japan and other countries on U.S. products "to make

[159] Daniel Bodansky and Elliot Diringer, "Towards an Integrated Multitrack Framework," Pew Center on Global Climate Change, December 2007, p. 16. Available at: http://www.pewclimate.org/multi-track
[160] For more, see: Corrado Di Maria and Edwin van der Werf, "Carbon Leakage Revisited: Unilateral Climate Policy with Directed Technical Change," *Environmental and Resource Economics* 39 (2008); Mustafa H. Babiker, "Climate Change Policy, Market Structure, and Carbon Leakage," *Journal of International Economics* 65:2 (2005); Claudia Kemfert, Wietze Lise, and Richard S.J. Tol, "Games of Climate Change with International Trade," *Environmental and Resource Economics* 28 (2004); Onno Kuik and Reyer Gerlagh, "Trade Liberalization and Carbon Leakage," *The Energy Journal* 24:3 (2003).
[161] Susan Schwab, "Statement of U.S. Trade Representative Susan C. Schwab before the U.S. Senate Trade and Finance Committee, March 6, 2008."
http://www.ustr.gov/assets/Document_Library/Transcripts/2008/March/asset_upload_file357_14581.pdf
[162] "Top UN Climate Official Criticizes EU Proposal for Green 'Border' Tax," *Bloomberg News*, March 3, 2008.

up for the fact that U.S. producers do not incur GHG-related costs of production and, therefore, produce goods that are less responsible toward the environment."[163]

Coercive, i.e. military, action seems implausible. During a discussion about climate change during a television appearance on "Real Time with Bill Maher," Congressman and presidential candidate Ron Paul (R-TX) pointedly posed the question, "So, do you want to invade China to make sure they don't pollute?"[164] The potential pitfalls of "carbon leakage" present another participatory challenge.

Carbon leakage is the migration of energy-intensive industries to countries with few restrictions (or none at all) on carbon dioxide emissions. In *Architectures for Agreement: Addressing Global Climate Change,* David Victor has contended that concerns about leakage are generally overstated, due to past experience of environmental regulation, U.S.-E.U. carbon price differentials (2006) without major industrial relocation, the high costs of addressing leakage, and dissimilar interests among major economies about whether leakage is in fact a major problem.[165] Sheila Olmstead disagrees with Victor. Also writing in *Architectures for Agreement*, she argued that "It would be a mistake to conclude that, because leakage is not occurring due to the current, very young, scattered regimes in developed countries, it will be an unimportant phenomenon under future climate policy scenarios."[166]

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[163] "International Trade and Climate Change: Economic, Legal, and Institutional Perspectives," *The International Bank for Reconstruction and Development/The World Bank*, 2007. Available at: http://www.worldbank.org. Accessed March 27, 2008).
[164] March 30, 2007.
[165] Victor, *Architectures for Agreement*, 135-137.
[166] Olmstead, *Architectures for Agreement*, 176.

Taking the middle ground, the Organization for Economic Cooperation and Development (OECD), an international organization composed of industrialized countries, argued in the Executive Summary of its *Environmental Outlook to 2030* that:

> Possible negative impacts on industrial competitiveness of environmental policies are a key obstacle to decisive policy actions. Resistance by affected sectors often challenges the political feasibility of introducing environmental measures such as emissions standards, targets and green taxes. But concerns about the competitiveness impacts of environmental policies are often overstated. Better information is needed on the actual impacts on affected firms and sectors and this should be compared with the wider and longer term benefits of environmental improvements and potential economy-wide efficiency gains. Nevertheless, some sectors can be adversely affected by environmental measures, especially when such measures are implemented in a non-global manner.[167]

Indeed, in the United States, carbon leakage is also emerging as a potential flashpoint for both U.S. climate change and trade policies. Organized labor has expressed concerns about competitiveness if other countries' goods are not subject to U.S. requirements under the Lieberman-Warner bill, or if the tariff provision is not passed into law.

At the March 13-14, 2008 "Good Jobs: Green Jobs" conference in Pittsburg, Pennsylvania, the United Steelworkers (USW) union raised concerns about the Lieberman-Warner climate change bill. According to the union, the legislation would be detrimental by permitting imports of carbon-intensive goods into the United States until 2020. In a statement delivered by special assistant Marco Trbovich, USW President Leo

[167] "OECD Environmental Outlook to 2030," Summary in English, The Organization for Economic Cooperation and Development," 2008: http://www.oecd.org/dataoecd/29/33/40200582.pdf, pp. 11-12.

W. Gerard said, "This flaw -- this gaping loophole -- would encourage energy-intensive industries in the U.S. to move production to those locations where the environmental rules are lax -- wiping out thousands more U.S. jobs in the process."[168] The union, which has supported efforts by organized labor and environmental groups to form a "Blue-Green Alliance" to boost job growth in the renewable energy sector, called upon its allies in the environmental movement to push for fair trade practices in future climate legislation. The issues of compliance and carbon leakage could be major stumbling blocks to implementing a new climate accord. Research in these areas remains vital.

Last but not least, international engagement by the United States on adaptation should be an essential component of a new U.S. global climate change policy. As part of a future climate deal, developing countries will want credible adaptation assistance. To the many developing countries in the Southern Hemisphere, "The north is responsible for most of the excess carbon in the atmosphere, so it owes the south a large debt. If the north wants to avoid dangerous climate change, it will have to repay that debt by financing low-carbon development in the south."[169] This could prove politically fraught in the United States, where technological transfer, patents, and corporate revenues are at stake. Yet, it must be pointed out that, at the 2007 Bali Conference, the developing countries did pledge to consider "mitigation actions" -- if backed up by technology, financing and capacity building -- in a post-2012 treaty.

For too long, the U.S. government has regrettably lacked a meaningful adaptation strategy to engage developing countries. Unfortunately, the bedrock principle of

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[168] "Steelworkers Call for Trade Reform at Green Jobs Conference," *PR Newswire*, March 13, 2008. http://prnwire.com/cgi-bin/stories.pl?ACCT=ind_focus.story&STORY=/www/story/03-13-2008/0004773727&EDATE=THU+Mar+13+2008,+03:00+PM (Accessed March 17, 2008.)

[169] Simon Retallack, "The Greening of the South," *Prospect* (U.K.), February 28, 2008. http://www.prospect-magazine.co.uk/article_details.php?id=10058 (Accessed March 10, 2008).

international climate change negotiations -- "common but differentiated responsibilities" -- has been a rhetorical roadblock for U.S. policymakers with respect to adaptation. This policy obstruction should be removed -- quickly.

If not addressed by the developed world, might adaptation become "a euphemism for social injustice on a global scale," as Archbishop and activist Desmond Tutu has asserted in the UN Human Development Report?[170] Certainly, different socio-economic approaches to public policy may account for some of the divergence in U.S. and European actions, for example. In contrast to many European discussions about climate change, "The American debate was never framed in terms of past responsibility. It was overwhelmingly focused on the costs of addressing the potential threat of climate change."[171] Climate change could potentially exacerbate humanitarian crises, too. (UN Secretary General Ban Ki Moon has written that "amid the diverse social and political causes, the Darfur conflict began as an ecological crisis, arising at least in part from climate change."[172]) Not surprisingly, some developing countries have taken umbrage at U.S. policy, which they view as inadequate to meet the potentially disruptive economic and environmental impacts of climate change.

To be sure, adaptation assistance is a controversial issue of considerable complexity. For their part, industrialized states do not welcome massive wealth transfer flows to states whose emissions have fallen since 1990 due to economic circumstances unrelated to environmental mitigation policy. Industrial countries will also look to protect

[170] Desmond Tutu, "We Do Not Need Climate Change Apartheid in Adaptation," in *United Nations Human Development Report 2007-2008*, "Fighting Climate Change: Human Solidarity in a Divided World," 26. Tutu is the Anglican archbishop emeritus of Cape Town, South Africa, and the 1984 Nobel Peace Prize Laureate.
[171] Cass, 222.
[172] Ban Ki Moon, "A Climate Culprit in Darfur," *Washington Post*, June 16, 2007, A15.

their own economic and technological proprietary interests. U.S. policymakers must answer the question of how the United States can support credible and measurable adaptation efforts in the poorest countries without compromising the key U.S. interest in having all major emitters reduce their carbon dioxide emissions.

Devising a strategic U.S. policy on global climate change remains a critical task for America's leaders. Both at home and from abroad, the next U.S. president will face growing calls for action. He or she will be faced with dozens of decisions to take on matters touching upon the core of the American way of life. More than ever, a constructive U.S. foreign policy on climate change will require careful and cooperative diplomacy with key partners and potential rivals. While implementing America's international climate strategy, policymakers will also have to be cognizant of U.S. domestic political realities. Without a doubt, the challenges of responding to climate change are immense. The risks of inaction, however, are much too great.

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