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Summary

In summary, the United States' cumulative GHG emissions have continue to be among the world's largest – topped only by the rise in Chinese emissions on an annual basis. Due to lack of leadership at the federal level, the U.S. still does not have a comprehensive plan to reduce emissions. In the absence of a national direction, many regions, states, and municipalities have begun to implement policies to reduce emissions on their own and in concert with other regions, states, and municipalities. The policies address a variety of sectors – in particular the electricity and transportation sectors and many aim to increase energy efficiency and renewable energy use. These efforts are complemented by action in the private and nongovernmental sectors and, in part driven by local and business initiatives, new proposals for legislation in the U.S. Congress.. The U.S. will elect its next President in November 2008, and all the remaining candidates have publicly endorsed climate change platforms that will dramatically reduce emissions. Collectively, it may be anticipated that these activities will lead to significant new U.S. policy within the next eighteen months.

1. Political context for U.S. climate change policy

The political winds on the issue of climate change are shifting; we believe that the United States is on the verge of federal policy to significantly reduce our greenhouse gas (GHG) emissions. New priorities have been indicated by the recent enactment of the 2007 Energy Independence and Security Act, which requires long-awaited substantial increases in automobile fuel economy and boosts biofuels use, and with the Supreme Court ruling of April 3, 2007, and its finding that the Clean Air Act extends to carbon dioxide. This court ruling increases pressure on the U.S. Environmental Protection Agency and the states to regulate CO_2 as a pollutant. On the heels of these actions, both houses of the U.S. Congress are considering development of a GHG cap-and-trade program; the Senate will likely vote on a legislative proposal for mandated reductions this summer, and the House of Representatives is preparing a series of options papers on design elements. The U.S. Congress continues to debate a renewable electricity standard and energy security bills. Additionally, the U.S. Environmental Protection Agency is preparing to issue regulations for mandatory GHG emissions reporting and rules for the use of carbon capture and sequestration technologies and a nationwide GHG emissions registry. Not least, the U.S. will elect its next president in November 2008, and each of the three candidates has publicly embraced a platform to dramatically reduce GHG emissions. U.S. policy is often made after a series of incremental steps toward a goal. Recent incremental progress seems to have set the stage for a tipping point in U.S. climate change policy.

2. Introduction

> "We'll be working with our allies to reduce greenhouse gases. But I will not accept a plan that will harm our economy and hurt American workers." -- United States President George W. Bush, speech on March 29, 2001

> "We simply must do everything we can in our power to slow down global warming before it is too late... The science is clear. The global warming debate is over." -- California State Governor Arnold Schwarzenegger, upon signing into law the historic California law, AB. 32, which caps greenhouse gases at 1990 levels by 2020. September 27, 2006.

The disparity between these two comments highlights the status of climate change policy in the United States: inaction at the federal level has spurred action at the state and local levels. Since he came into office in January 2001, U.S. President George W. Bush has opposed both U.S. ratification of the Kyoto Protocol and any national plan that mandates reductions in GHGs, on the dual grounds that the Kyoto Protocol does not require reduction commitments from countries like China and India, and that a national requirement would hurt the U.S. economy and therefore U.S. workers. Instead, in May 2001 the administration proposed an energy plan that would have significantly increased the country's use of coal, natural gas and oil overall,[1] and it claims that that the most effective way to pursue GHG reductions is to fund incentives and technology research.[2]

In addition to opposing national mandatory caps, the Bush Administration has been accused repeatedly by its own government scientists of trying to muffle and even suppress scientific research findings showing the full impacts of global warming. Perhaps the most high-profile scientist to speak out publicly is the Director of the National Aeronautics and Space Administration (NASA) Goddard Institute for Space Studies' James Hansen. Hansen said in October of 2004: "In my more than three decades in government, I have never seen anything approaching the degree to which information flow from scientists to the public has been screened and controlled as it is now." In addition, several scientists at the National Oceanic and Atmospheric Administration also claim to have had their scientific research findings on global warming downplayed or kept from public release.[3]

In the absence of leadership from the United States government, many individual states and cities are developing and implementing mandatory GHG reduction programs. Additionally, three regional groups of states (and Canadian provinces) have cooperated to develop and implement regional GHG cap and trade systems. Twenty five states are putting laws in place to require that a portion of their energy comes from renewable sources and some are establishing funds to improve consumer efficiency.

Some Members of Congress are also showing leadership by proposing legislation to cap GHG emissions, require the use of renewable energy, increase standards for energy efficiency, and other measures to reduce greenhouse gases. Some private companies are banding together to develop strategies for reducing their GHG footprints, and a wide variety of NGOs have ongoing programs to spur policy changes and on-the-ground reductions of GHGs at the local, state, and federal levels. The United States will elect its next President in November 2008, and all three major candidates have public platforms on climate change. Two of them pledge to cut emissions by 80% by 2050, and the other has introduced a bill in the U.S. Senate to cut emissions 60% by 2050. Therefore, no matter who assumes office in 2009, U.S. policy is expected to look very different in the coming year.

3. Trends in U.S. global warming emissions

3.1 Current emissions

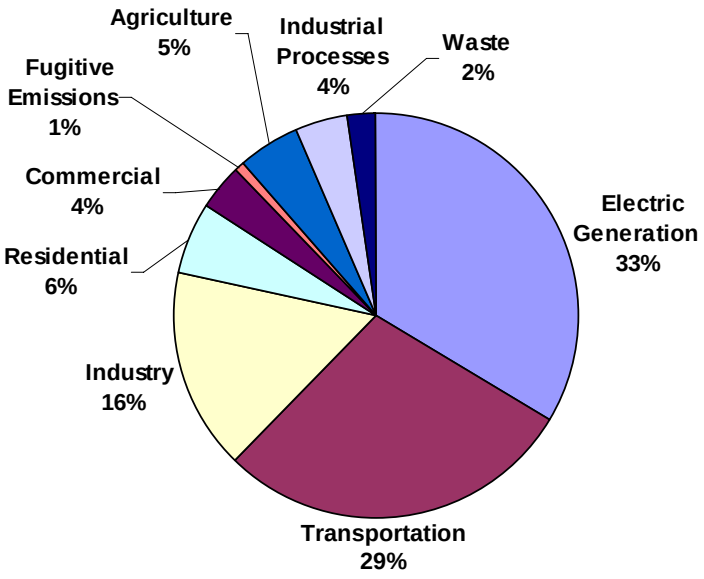
Since the early 1950s, the United States has produced approximately 27%[4] of global carbon dioxide (CO_2) emissions, nearly three times more than any other country on earth. In 2005, U.S. GHG emissions were 7,282 million tonnes of carbon dioxide equivalent ($MtCO_2e$) [5], a national total only exceeded by that of China[6], according to the International Energy Agency (Figure 1). The U.S. Environmental Protection Agency's own latest national inventory (in pre-release) estimates total 2005 emissions at 7,314 $MtCO_2e$, revised upwards from last year's published total of 7,260 $MtCO_2e$. With only 4% of the world's population, the U.S.'s emissions constitute 17% of the world's total emissions. Consequently, each U.S. citizen emits an average of 25 tons of CO_2 equivalent per year, more than twice the per capita emissions of the EU and roughly four times the world average.

As is the case in many industrialized countries, the two primary sectors driving emissions in the United States are electric generation and transportation, due to the combustion of fossil fuels in electricity generation and vehicles for transport. These two sectors account for 62% of U.S. emissions, with electricity generation contributing 33% and transportation contributing 29% (Figure 2). Emissions from the industrial sector – which includes fuel use for all manufacturing activities (e.g., chemical production, iron and steel production) – are a distant third, contributing 16% of emissions.

Figure 1: Top ten GHG emitting countries

Country	GHG Emissions ($MtCO_2e$)	% of World GHGs
1. China	7,484	17.3
2. United States of America	**7,282**	**16.8**
3. India	2,380	5.5
4. Russian Federation	2,206	5.1
5. Brazil	1,857	4.3
6. Japan	1,405	3.2
7. Germany	1,006	2.3
8. Indonesia	869	2.0
9. Canada	728	1.7
10. Mexico	682	1.6
Top 10	***25,899***	***59.8***
Rest of World	***17,393***	***40.2***
World Total	***43,292***	***100.0***
Source: IEA (2007).		
Notes: All data are for 2005—the latest year for which an international six-gas analysis is available. Totals include CO_2, CH_4, N_2O, HFCs, PFCs, SF_6. Totals exclude some emissions from land-use change and forestry.		

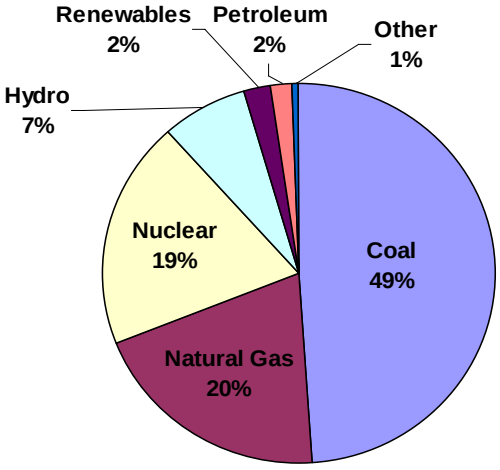
Figure 2: U.S. GHG emissions by sector



Source: WRI, CAIT 2007

The top emitting sectors in the U.S. – electric generation and transportation – are dominated by the use of fossil fuels. Fossil fuels account for 71% of electricity generation, with renewable energy (including hydro) only accounting for 9% and nuclear accounting for 19% (Figure 3). Despite a recent surge in biofuel consumption, transportation fuels are still comprised of approximately 96% petroleum.

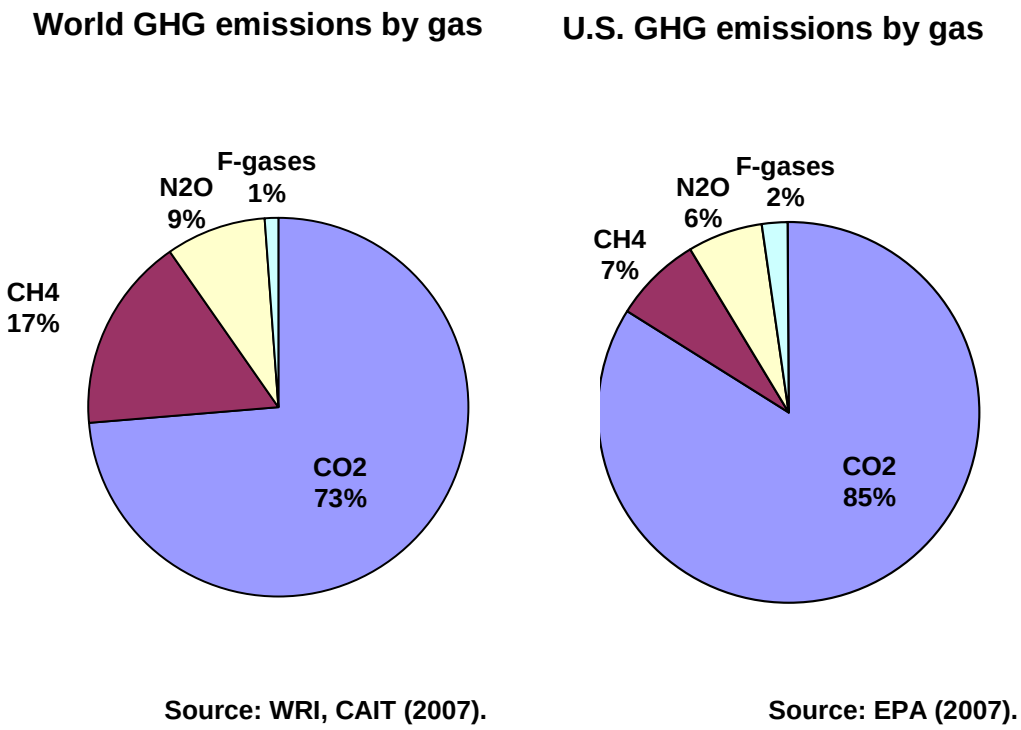
Figure 3: U.S. electric generation by fuel source



Source: EIA 2007(a)

As a result of this heavy reliance on fossil fuels, U.S. GHG emissions are primarily comprised of CO_2 gas (85%), with nitrous oxide (N_2O) and methane (CH_4) accounting for a significantly smaller percentage of total emissions (Figure 4). The combined percentage contributions of N_2O and CH_4 to the U.S. greenhouse gas emissions profile is about half that of the world as a whole due to the United States economy being principally industrial rather than agrarian.

Figure 4: U.S. and world GHG emissions by gas



Source: WRI, CAIT (2007). **Source: EPA (2007).**

3.2 Emissions trends

The historical trends in U.S. emissions are no less disturbing. Total U.S. GHG emissions from 1990 to 2005 have grown by approximately 1% per year, with a total increase of 16% during this time period (Figure 5).

Because of their size and contributions to GHG emissions, and consistent with current emissions figures, the growth in energy sectors (e.g., electricity generation, transportation, industry) is also the major driver behind GHG growth.

Figure 5: U.S. and world GHG emission trends by sector: 1990-2005

CO_2, CH_4, N_2O, HFCs, PFCs, SF_6					
	U.S.				
Sector	**1990 Emissions ($MtCO_2e$)**	**2005 Emissions ($MtCO_2e$)**	**Absolute Change ($MtCO_2e$)**	**Avg. Annual % Change**	**% Change**
Energy	5,360	6,314	954	1.1	18
Industrial Processes	173	198	24	0.9	14
Agriculture	457	490	33	0.5	7
Waste	230	197	-33	-1.0	-14
Other	76	83	7	0.6	10
Total U.S.	***6,296***	***7,282***	***986***	***1.0***	***16***
	WORLD				
Sector	**1990 Emissions ($MtCO_2e$)**	**2005 Emissions ($MtCO_2e$)**	**Absolute Change ($MtCO_2e$)**	**Avg. Annual % Change**	**% Change**
Energy	23,630	29,788	6,158	1.6	26
Industrial Processes	1,201	2,141	940	3.9	78
Agriculture	5,741	6,232	491	0.5	9
Waste	1,099	1,232	133	0.8	12
Other	2,758	3,900	1,142	2.3	41
Total World	***34,429***	***43,292***	***8,863***	***1.5***	***26***
Source: IEA (2007).					
Notes: Data exclude some emissions from land-use change and forestry.					

3.3 Emissions projections

According to the U.S. Energy Information Administration's 2007 *Annual Energy Outlook*, U.S. carbon dioxide emissions from energy use will grow approximately 25% between 2004 and 2025[7], assuming the U.S. continues to conduct "business as usual (BAU)."[8] These projected emissions would make the U.S. second only to China in absolute emissions growth. The electricity generation sector, projected to grow by about 29%, and the transportation sector, projected to grow by almost 26% by 2025, will be the drivers behind increased U.S. GHG emissions.

Notably, there have recently been some substantial revisions to these projections. These include reduced GDP growth, increased energy prices and the incorporation of H.R.6, the "Energy Independence and Security Act of 2007." As a result, estimates now forecast an emissions growth of around 10% by 2025 (approximately 0.6% growth annually), equivalent to nearly one billion metric tons fewer of CO_2 released in 2025. Although not finalized or officially published, these new EIA model data suggest that U.S. emissions will not grow as quickly as previously anticipated. Nevertheless, U.S. total emissions in 2025 exceed all countries except China.

4. Current and proposed U.S. climate change policy

While the current Congress has enacted various policies that are likely to reduce GHG emissions, the United States currently has no comprehensive national policy to specifically address GHG emissions. In February 2002, President Bush announced a goal to reduce "greenhouse gas intensity" – the ratio of GHG emissions to economic output expressed in gross domestic product (GDP) – by 18% in 2012. Since then, President Bush has proposed additional voluntary measures to achieve this reduction. A GHG intensity goal, however, can decrease the carbon intensity of the economy while allowing GHG emissions to increase,[9] and the continued rise in U.S. emissions indicate that this type of goal will not stabilize or reduce greenhouse gas emissions in the United States.

The question of how to address climate change and is still hotly debated in the United States. A January 2007 Pew Research Center poll shows that 77% of U.S. citizens believe that the earth is warming, but there is far less agreement as to the cause (47% believe it is due to human activity; 20% believe it is due to natural causes; 16% aren't sure).[10] In addition, polls generally agree that of environmental issues, Americans consider global warming to be most critical,[11] but they view global warming as a relatively low priority compared to other issues of the day.[10]

In light of the ongoing public conversation about how and whether to address climate change, dozens of legislative proposals have been put forth in Congress but few have gained traction. These bills relate to all aspects of climate and energy regulation, such as capping emissions, renewable energy goals, energy efficiency improvements, mandatory emissions registries, and more. However, only a small number of call for explicit caps or pricing on GHG emissions.

Among the most aggressive legislative proposals (see Figure 6) are the Global Warming Pollution Reduction Act (S.309) sponsored by Senators Sanders and Boxer and the Global Warming Reduction Act of 2007 (S.485) sponsored by Senators Kerry and Snowe. S. 309 reflects the policy architecture of California's AB 32 by mandating aggressive emissions reductions while avoiding policy specifics. Rather than specifically require a cap and trade program, S. 309 would give the EPA the freedom to implement any policies necessary to achieve the required levels of mitigation. While S. 485 calls for a cap and trade to achieve a slightly more modest mitigation trajectory, this proposal also lacks specificity on such important design elements as the point of regulation, allocation schemes and cost containment mechanisms.

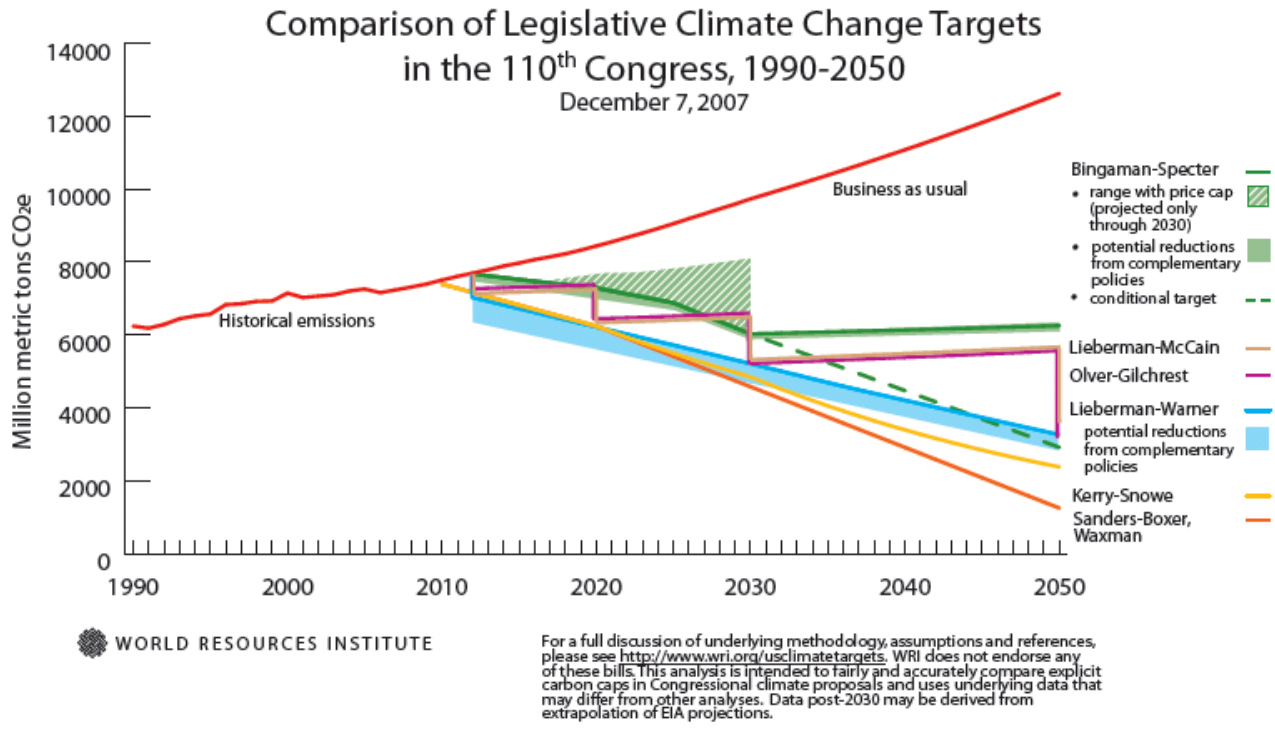
In contrast, the Low Carbon Economy Act (S. 1766) introduced by Senators Bingaman and Specter, was one of the first proposals to tackle some of these difficult questions. Based on a proposal by the National Commission on Energy Policy, S. 1766 provides a high level of legislative detail, but more conservative targets and cost containment mechanisms mean this bill would be unlikely to achieve the emission reductions called for by the other proposals. In general, the more conservative nature of this bill has led to the most bipartisan support of any climate proposal.

The Climate Stewardship and Innovation Act of 2007 (S. 280) sponsored by Senators Lieberman and McCain has been used as a test vote in previous sessions of the Senate. While this bill seemed to be the primary vehicle for climate change legislation in the Senate during the 108th and 109th Congresses, Senator McCain's Presidential campaign led Senator Lieberman to find a new Republican champion in the 110th Congress, resulting in his cooperation with Senator Warner on America's Climate Security Act (S. 2191).

Currently, S.2191 is enjoying the most attention in the Senate. It has passed out of the Environment and Public Works Committee and now waits for consideration by the full Senate. Debate on this bill is expect in early Summer but is not guaranteed as other topics such as the Iraq War, the general election and the Congressional deliberations over the Federal budget are likely to be greater priorities the as the Congressional session grows short. Economic modeling of the bill as it was passed out of committee was completed on March 14, 2008 and is available at http://www.epa.gov/climatechange/economics/economicanalyses.html.

While several bills have been introduced in the House of Representatives, these typically mirror existing Senate proposals. The Climate Stewardship Act of 2007 (H.R. 620) sponsored by Representatives Olver and Gilchrest mirrors the framework of S. 280 while the Safe Climate Act of 2007 (H.R. 1590) sponsored by Representative Waxman maintains similar targets to S. 309. Nevertheless, no bill has begun to move in the House. The Energy and Commerce committee has issued a series of white papers exploring different design issues for a federal cap and trade program and will hold several hearings on them.[12] The Committee Chairman John Dingell (D-MI) has stated that he intends to have a bill for consideration before the end of the 2008 session but for the same reasons cited in the Senate discussion above, this may be unlikely.

Figure 6: Comparison of legislative climate change targets in the 110th Congress



Beyond the explicit caps and point of coverage evaluated in Figure 6, current legislative proposals differ widely on a variety of design elements. The use of offsets, the imposition of price caps and the distribution of allowances and auction revenues are just some of the factors that differentiate the proposals discussed above. The key differences between the proposals are outlined in Appendix A.

5. U.S. sectoral climate policy

To the limited extent that the U.S. has enacted national policies that affect climate change, it has done so through sectoral efforts. Perhaps the most significant policies affecting U.S. GHGs have been signed as laws that affect energy use, in the form of the 2005 Energy Policy Act and the 2007 Energy Independence and Security Act.

5.1 Automobiles

GHG emissions from the transportation sector comprise 29% of U.S. GHG emissions,[13] and 62% of these come from passenger cars and light-duty trucks.[14] Climate-related policy relating to automobiles is mainly confined to auto efficiency and fuel mix. There is some momentum for also regulating CO_2 emissions from tailpipes, discussed below in the state and local initiatives section.

Fuel combustion efficiency standards for automobiles in the U.S. are measured as a fleet-wide average of miles per gallon achieved, or corporate average fuel economy (CAFE). Despite the clear importance of this sector, and in a testament to the political strength of auto manufacturers in the U.S., there had been no significant improvements to CAFE standards in the U.S. since 1975, when CAFE standards were set at fleet-wide averages of 27.5 miles per gallon for cars and 22.2 mpg for light trucks and sports utility vehicles. The 2007 Energy Independence and Security Act raised fuel economy standards to a fleet-wide average of 35 miles per gallon, to be attained by 2020. The Union of Concerned Scientists estimates that this provision will save 1.1 million barrels of oil per day by 2020 and 2.5 million barrels of oil per day in 2030,[15] or approximately 407,000 metric tons of CO_2 per day by 2020 and 925,050 metric tons CO_2 by day by 2030.

5.2 Biofuels

In the U.S., gasoline is by far most prevalent transport fuel. Ethanol is the most prevalent alternative to fossil fuels, and markets throughout the U.S. demand that various low-level blends of up to 10% ethanol be mixed with gasoline.[16] E85, a fuel that is 85% ethanol and 15% gasoline, is also used for "flexible fuel" vehicles, although there are relatively few stations in the U.S. – approximately 1,350, or about 1% of U.S. gasoline stations in the U.S., as of February 2008[17] – in the U.S. that actually are able to provide E85 to consumers. Ninety-five percent of U.S.-produced ethanol comes from corn kernels; most of the rest comes from other sugar or oil-rich crops. Cellulosic and other advanced biofuels do not significantly contribute to the fuel mix.

The 2007 energy bill represents the most significant recent expansions in biofuels policy. The bill mandated increases in biofuel consumption to 36 billion gallons and increased the amount of cellulosic ethanol required (from the 250 million gallons [946 million litres] required in the 2005 energy bill) as well as other advanced biofuels. In addition, the bill included certain limited environmental safeguards such as a minimum lifecycle GHG emission standards for qualifying biofuels and provisions to protect sensitive lands from biofuels production. The methodology for calculating and implementing the lifecycle GHG reduction is still to be developed.

The use and extent of biofuels in the U.S. is becoming more controversial in light of recent studies showing significant net GHG increases arising from biofuel production when land use is taken into account.[18] Authors of these studies sent a letter to both President Bush and the Speaker of the House of Representatives, Nancy Pelosi, urging them to revise U.S. biofuels policies.

Powerful constituencies combined with inertia in the political system mean that existing subsidies, tax credits, mandates and other government support from which ethanol and other biofuels benefit are not likely to disappear in the near term.

5.3 Consumer energy efficiency

The Energy Independence and Security Act of 2007 was also a significant step forward in setting energy efficiency standards for consumer appliances and equipment. The U.S. Congress first established efficiency standards for consumer products in 1985, and it periodically adds to the number and diversity of products covered. According to the Alliance to Save Energy, the 2007 law was the "most sweeping energy efficiency legislation in at least three decades," covering ten new products such as boilers, dishwashers, refrigerators, light bulbs and electric motors. The American Council for an Energy Efficient Economy estimates the law will reduce energy consumption 7% and GHG emissions 9% from 2030 forecasts by the Department of Energy.[19] Notably, the law requires light bulbs (or "lamps") to reduce energy usage to about 65% of today's consumption by 2020, and for a combination of research, development and deployment to make all new commercial buildings "zero energy" (producing as much energy as they use) by 2020 and all existing buildings to "zero energy" by 2050.[20]

5.4 Renewable energy

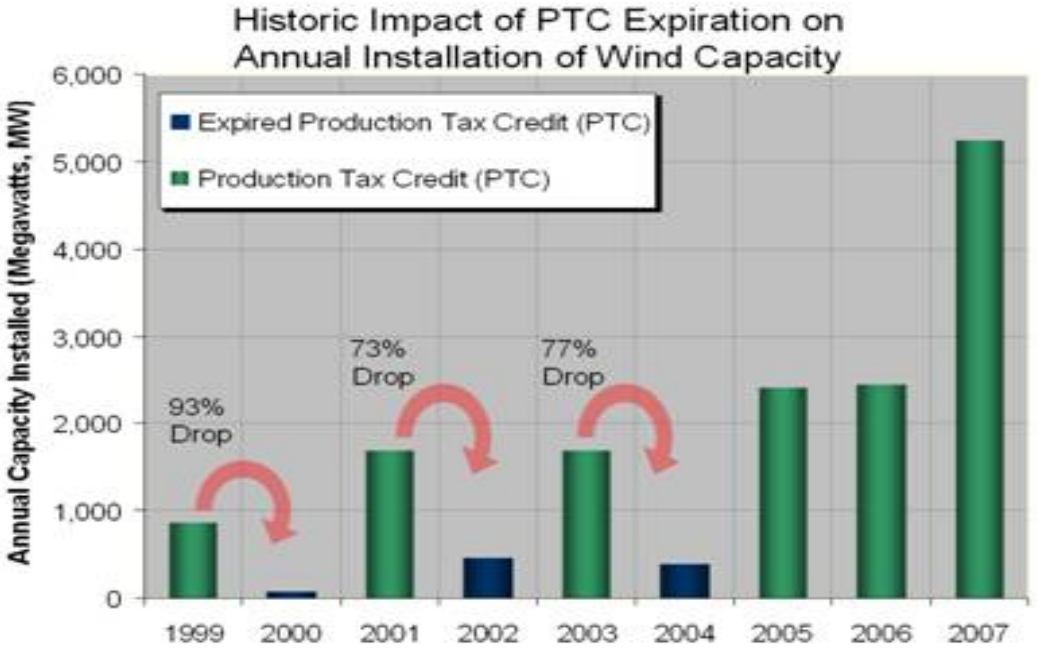
Although renewable energy, including wind, solar, geothermal, and biomass[21] currently comprises only 2% of U.S. electricity (see Figure 3)[22] policymakers have sought to apply a variety of mechanisms to bring renewable technologies to scale. In particular, two significant tax policies have sought to expand renewable generation. The production tax credit (PTC), first enacted in 1994, provides a steady revenue source for the first ten years of a project's operation based on the output of the facility. Although the list of eligible resources includes a wide variety of renewables including wind, solar, biomass, geothermal, landfill gas, municipal solid waste and "incremental" hydropower (efficiency increases without using more water), the PTC has been most successful at promoting deployment of the most mature and efficient renewable technologies. The investment tax credit (ITC), on the other hand, provides an immediate payback for more capital intensive renewable projects. By buying down the cost of installation rather than paying producers for generation, the ITC encourages the deployment of less mature and more expensive technologies such as solar photovoltaics.

Even though these programs have been viewed as largely successful in expanding the use of renewables, political reality has allowed the credits to expire multiple times since they were first adopted. The resulting boom-and-bust cycle has been particularly problematic as it has hampered sustained growth of the renewable energy industry (see Figure 7). In order to avoid another lapse in the credits at the end of 2008, Congress aimed to include a four or five year extension of the credits in the 2007 Energy Independence and Security Act. Although this extension was passed by the House of Representatives, Senate minority opposition to the offsetting tax increases on petroleum production halted inclusion of the tax title.

A similar loss in the Senate Energy Independence and Security Act negotiations was the rejection of a national renewable electricity standard. Although national standards are hotly debated, there are no current national requirements for the generation, sale or consumption of renewable electricity. While a mandate for renewables to supply 15 percent of U.S. electricity generation by 2020 passed in the House of Representatives as part of the 2007 energy act negotiations, Senators narrowly failed to overcome a Republican filibuster of the proposal.

Efforts to modify the standard by allowing energy efficiency improvements to count for some of the required renewable generation were not able to generate the required votes for passage.

Figure 7: Historic impact of PTC expiration on annual installation of wind capacity



[23]

6. Policies initiatives at the state and local levels

Historically, the U.S. federal system has provided an opportunity for states to innovate, with states leading in responding to environmental challenges such as acid rain, appliance standards, asbestos in schools, and vehicle emissions, as well as countless non-environmental matters. In each of these cases, subsequent federal action has affected the role for states, usually introducing some form of preemption, where a federal floor is established to bring all states up to a uniform standard while leaving room for states to continue to develop innovative programs to achieve greater environmental benefits within the federal framework. In addition to this dynamic, states have primary authority over several policy areas that are relevant to climate change such as building codes, land use planning, transportation infrastructure and electricity and natural gas utility regulation. Even under a federal cap-and-trade program, states will still have an important role to play in pursuing and implementing complementary policies and pushing for stronger federal action. It is unclear, however, that states will be left with the authority to implement independent cap and trade programs.

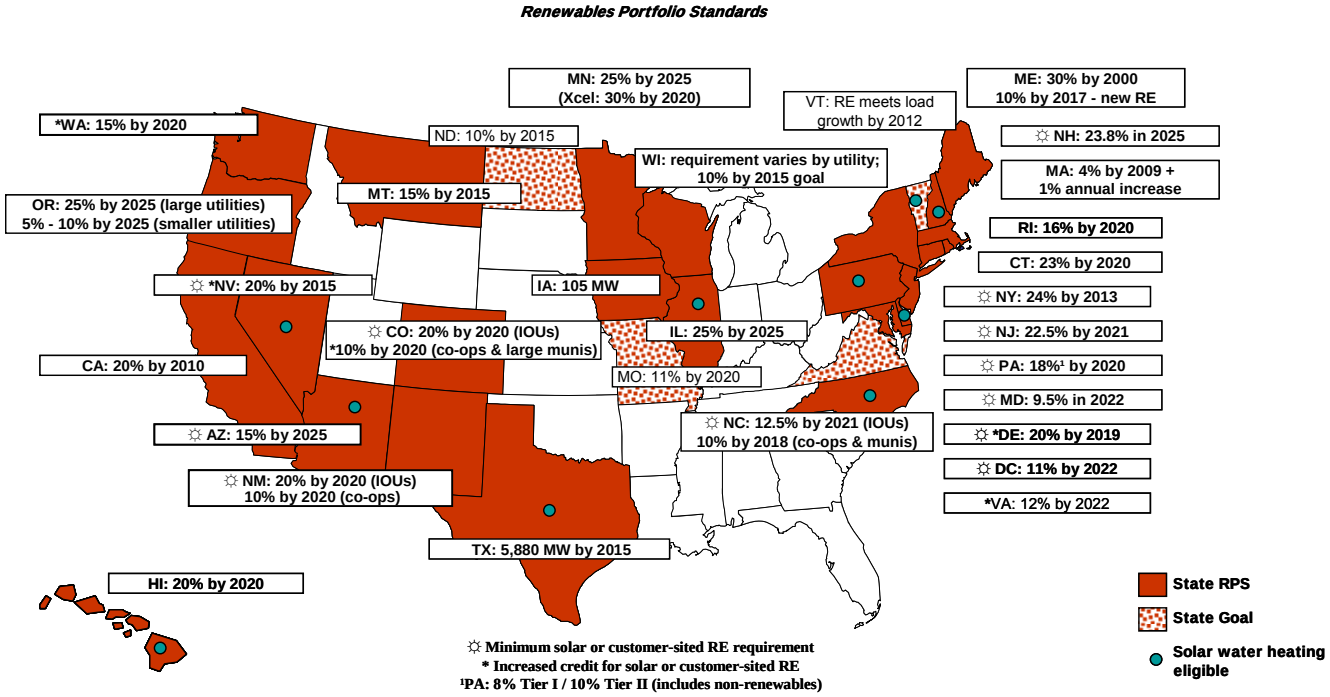
Until federal legislation is passed, and in the absence of U.S. Administration interest, many U.S. states and regions have taken it upon themselves to act to address the problem. Regional cap and trade programs include the Regional Greenhouse Gas Initiative, the Midwest Governors Accord, and the Western Climate Initiative. In addition, some states have adopted statewide emissions caps or policies. The state of California has the most aggressive plan; it enacted first-ever legislation that will reduce California's GHG emissions to 1990 levels by 2020. In addition, Governor Schwarzenegger signed Executive Order S-3-05 in to law in 2005, which establishes a state target of GHG emissions that are 80% below 1990 levels by 2050. A number of states have followed California's legislative lead, including Maine, Vermont, New Hampshire, Connecticut, Rhode Island, New Jersey, New York, Illinois, Oregon and Washington, and more have enacted or are considering similar policies.

6.1 State renewable energy policies

Renewable energy standards have been the subject of intense debate at the national level for at least the last ten years, but they have not yet been adopted on a nationwide scale. Twenty five states and the District of Columbia, however, have passed renewable energy standards (Renewable Electricity Standards, or RESs, sometimes also called Renewable Portfolio Standards or RPSs) requiring that utilities provide a certain percentage of their power derived from renewable sources by a certain date. See Figure 8 for states that have RESs and their specific requirements.

Typically, state RESs define "renewable" energy in ways that support emerging technologies and low-carbon fuel alternatives. Though there is a great deal of variation in what states allow as "renewable," sources such as wind, solar thermal, solar electric, geothermal, some biomass sources,[24] some hydropower sources,[25] and landfill gas are commonly included in the definition.

Figure 8: State renewable portfolio standards



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The Union of Concerned Scientists estimates that the state standards will increase new renewable power in the U.S. by 340% over 1997 levels by 2020, or by 46,270 MW. In turn, these renewable power increases will reduce GHG emissions by 108 million metric tons.[27] Other major renewable energy policies have been enacted in the states, such as state Public Benefits Funds (enacted in 15 states), in which utilities are charged a small amount for electricity produced and the proceeds are put into a fund for consumer benefit; net metering, in which consumers get retail credit for electricity they generate (all 50 states have enacted) and State Fuel Mix and Emissions Disclosure Rules (24 states have enacted).

6.2 State consumer energy efficiency policies

Many states have enacted policies that improve energy efficiency – such as system benefits funds, which charge consumers for electricity use and use the funds for efficiency improvements; building codes and appliance standards, which are typically legislatively-mandated efficiency standards; and rate decoupling, which ensures utilities have an incentive to promote energy efficiency. For more information about state efficiency policies, see the Database of State Incentives for Renewables and Efficiency at www.dsireusa.org or the Alliance to Save Energy at www.ase.org.

6.3 California tailpipe emission standards

A heated battle has been fought for over 6 years over the ability of individual states to set GHG tailpipe emissions standards for automobiles. Under U.S. law, California is the only state that is permitted to set auto pollution standards more stringent than those set by the federal government under the Clean Air Act and they must do so with the explicit approval of the U.S.

Environmental Protection Agency. In 2002, California's Governor Grey Davis signed a historic state law requiring the California Air Resources Board (CARB) to develop regulations reducing GHG emissions from cars and light trucks sold in California.

California's announcement was significant and controversial because, as the federal Clean Air Act does not specifically address the regulation of CO_2, there was a question about the authority of both the federal government and any state to regulate CO_2 under the Act. Other states in the union are able to adopt either the federal auto standards or California's auto standards once they are approved.

California Governor Arnold Schwarzenegger announced the tailpipe regulations in September 2004 which require all vehicles sold in California of model year 2009 and later to reduce GHG emissions, escalating to a 30% reduction by 2016. With 26 million vehicles on the road, California represents about 10% of the auto market in the country, and auto manufactures typically manufacture cars to meet California's standards in order to avoid manufacturing different cars for different markets. In December of that year, the Alliance of Automobile Manufacturers, the Association of International Automobile Manufacturers, and some California auto dealerships sued the state of California in federal court in an effort to block the California "clean car" regulations, as they have come to be known. Since that time, 12 additional states have moved to adopt California's clean car standards, comprising over 40% of the U.S. auto market. In addition, Canada will pursue reductions similar to those required by California.

These 13 U.S. states and others have pursued resolution to the two major hurdles standing in their way to implementing the standards: the automakers' legal suits and obtaining approval from the U.S. EPA. In a groundbreaking ruling in the case of *Massachusetts v. EPA* in November 2006, the United States Supreme Court ruled in favor of 14 states, several cities and a number of environmental groups that EPA does in fact have authority under the Clean Air Act to regulate CO_2 from motor vehicles. This ruling effectively established states' authority to regulate CO_2 under the Clean Air Act and broke down legal barriers to implementation, leaving EPA approval as the final hurdle.

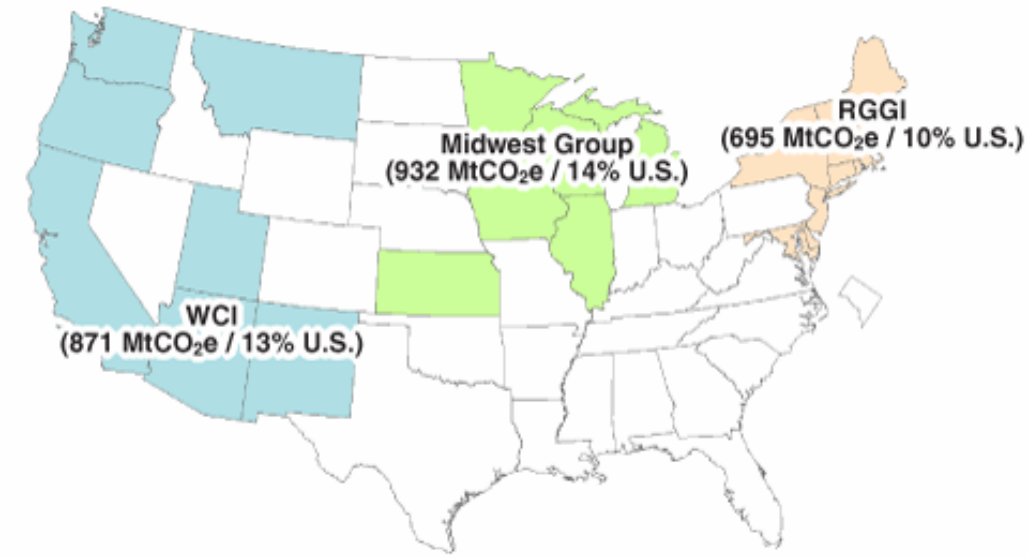
In the history of California's waiver petitions to set regulations on motor vehicles more stringent than federal requirements, EPA had never previously denied a waiver under the Clean Air Act. In December 2007, EPA issued an unprecedented denial of California's waiver request, saying that the national fuel economy increases that President Bush had signed earlier in the month – in the 2007 energy bill – would be "more effective than a partial state-by-state approach." [28] California's subsequent technical analysis found that in fact, the California standards would reduce GHG emissions by 9 million more tonnes by 2016 than the federal standards would. By 2020, the California regulations would reduce almost 14 million tonnes of CO_2, or 77%, more than the federal standards would acheive.[29]

In January 2008, California plus 15 states and five environmental organizations petitioned the federal court to reverse EPA's decision to deny California its waiver to implement the clean car standards and are currently awaiting a response.

6.4 Regional climate initiatives

In addition to states setting climate policies of their own, there are three examples of states (and in some cases, Canadian provinces) banding together within a region to set region-wide climate reduction policies and programs. In November 2007, the third regional group signed an agreement, bringing to 23 the total number of states that are participating in regional cap-and-trade programs. Nearly half of all U.S. citizens will be living in areas covered by one of these regional programs.

Figure 9: Regional GHG initiatives



Source: WRI, 2007.[30]

6.4.1 Regional Greenhouse Gas Initiative (RGGI): Northeast and Mid-Atlantic U.S.:

In April 2003, New York State Governor George Pataki invited 11 Governors in the Northeast and Mid-Atlantic regions of the U.S. to discuss a regional cap and trade GHG reduction program to cover CO_2 emissions from electric utilities in the region. By September of that year, the environmental executives from nine of the states, including, Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont, had endorsed a plan to develop a regional cap-and-trade program. In the group's words, the goal of the Initiative is to

> Develop a multi-state cap-and-trade program covering greenhouse gas (GHG) emissions. The program will initially be aimed at developing a program to reduce carbon dioxide emissions from power plants in the participating states, while maintaining energy affordability and reliability and accommodating, to the extent feasible, the diversity in policies and programs in individual states.

Signatory states to the initiative have developed a "CO_2 Budget Trading Program" – and a Model Rule to guide actions – that applies to fossil fuel-fired generating units of 25 MW or larger.[31]

The program intends to stabilize GHG emissions from the power sector over the first six years of implementation (2009 – 2014) at levels approximately equal to current emissions and then begin a 2.5% decline per year over the subsequent 4 years (2015 – 2018). The intent is to achieve a 10% reduction in GHG emissions from the 2009 budget by 2018.[32]

Allocations: RGGI apportioned allowances among signatory states using a methodology roughly based on current emissions in each state. Signatories to the Initiative each agreed to auction at least 25% of their allowances (each worth one ton of CO_2 emission equivalent) and use the proceeds to support consumer benefits, primarily energy efficiency and renewable energy projects such as lighting retrofits and home weatherization. Six of the nine signatories have committed to auctioning 100% or nearly 100% and using proceeds for public benefit.

Flexibility and cost-containment measures: The model rule includes a two-tier price trigger system. When price triggers (at $7 and $10 per ton) are reached, compliance options become increasingly flexible, using means such as allowing more offset allowances to satisfy increasing percentages of a utility's obligation (up to 10%) or extended compliance timeframes.

Emissions monitoring: Emissions monitoring is based upon EPA's acid rain program monitoring provisions, providing for each CO_2 budget unit to "install and certify emissions monitoring systems and to collect, report, quality-assure and report data necessary to quantify CO_2 mass emissions from that unit."

Offsets: The RGGI model rule allows for each CO_2 budget unit to account for some portion of its reductions through offsets allowances, or projects outside of the GHG cap that reduce or sequester GHG. In the absence of price triggers, a unit may use offset allowances to account for 3.3% of its compliance obligation; the portion of compliance that may be met with offsets rises in the cases of stage 1 and stage 2 price triggers to 5% and 10%, respectively. For more information on RGGI, see www.RGGI.org.

6.4.2 Western Climate Initiative: Western U.S.

A second regional effort is the Western Climate Initiative (WCI). This initiative was launched in February 2007 in order to develop strategies applicable to the U.S.'s Western Region to address global warming. The Governors of Arizona, California, New Mexico, Oregon and Washington were the original participants; since its launch, the Governor of Utah and the Premieres of British Columbia and Manitoba have joined as partners.

In August of 2007, WCI participants reached agreement on a "Statement of Regional Goal" by aggregating the goals set by each individual state and province for 2020. The goal states that "The Western Climate Initiative Regional greenhouse gas emission reduction goal is an aggregate reduction of 15% below 2005 levels by 2020."

The participants in the WCI have agreed to design a cap-and-trade system by August 2008; they have developed a workplan and five working groups to work on different design aspects of the system: reporting, scope, electricity (looking at scope and point of regulation specifically for the electricity sector), allocations, and offsets. While the workgroups are still in the process of development, they are guided by nine 'design principles,'[33] some of which include a commitment to making all reductions "real, surplus/additional, verifiable, permanent, and enforceable;" stimulat(ing) investment, especially in low carbon technologies, and reward(ing) innovations;" provid(ing) appropriate recognition and incentives for early emissions reductions;

Facilitat(ing) linkage to similarly rigorous regional and international greenhouse gas reduction markets and encourage(ing) other states, provinces, and countries to join the market."

The initiative maintains a website, www.westernclimateinitiative.org, that describes the process, posts relevant documents and work products and solicits input; it established a listserv open to the public; and it will host workshops and information sessions by conference call and in person.

6.4.3 Midwest Greenhouse Gas Accord

An even more recent initiative was launched by six Midwestern states and one Canadian province[34] in November 2007. These states and province have committed to developing a Midwestern Greenhouse Gas Reduction Program that will use a "market-based" and "multi-sector cap and trade mechanism" to reduce GHGs on a target level and timeframe consistent with individual member states and provinces' goals. As with the other regional cap and trade initiatives, the member states and provinces have agreed to join the Climate Registry, and the initiative will use complementary policies such as regional funding, incentive programs and low-carbon fuel standards.

This regional climate accord is particularly notable because the GHG emissions from this group of states is the largest of the three regional programs, contributing 14% of U.S. GHG emissions.

The principles guiding the program's development are:[35]

1. enable linkage to other jurisdictions' systems to create economies of scale, increase market efficiencies, diversity and liquidity, while reducing costs; and
2. maximize economic and employment benefits, while minimizing any transitional job
3. reduce the shifting of generation and emissions to non-participating states; and
4. credit past and present actions to reduce GHG emissions; and
5. address potential interaction or integration with a future federal program.

The partners are currently working through the establishment of workgroups and a stakeholder process to establish targets and timeframes for implementation by July15, 2008; complete development of proposed cap and trade agreement and model rule by November 15, 2008; and to complete all necessary implementation measures by April 2010. Find more information about the Midwest Greenhouse Gas Accord at http://www.midwesterngovernors.org/govenergynov.htm.

6.5 U.S. Mayors Climate Protection Initiative

On February 16, 2005, the day that the Kyoto Protocol went into effect for signatory countries, Seattle, Washington, Mayor Greg Nickels launched the U.S. Mayors Climate Protection Initiative in order to advance the goals of the Kyoto Protocol in the U.S. This historic initiative provides a way for Mayors - U.S. leaders at the city level – to establish and pursue strategies to reduce GHG emissions.

Under the agreement, participating cities commit to taking the following three actions:[36]

1. Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns.

2. Urge their state governments and the federal government to enact policies and programs to meet or beat the greenhouse gas emissions reduction target suggested for the U.S. in the Kyoto Protocol – 7% reduction from 1990 levels by 2012, and

3. Urge the U.S. Congress to pass the bipartisan greenhouse gas reduction legislation, which would establish a national emissions trading system.

As of February 2008, there are 796 Mayors participating in the U.S. Mayors Climate Protection Initiative, from all 50 states and the District of Columbia and Puerto Rico, and representing over 77,814,619 citizens. Find out more about the U.S. Mayors Climate Protection Initiative at http://www.usmayors.org/climateprotection.

6.6 The Climate Registry

The Climate Registry is a collaboration between 39 U.S. states, seven Canadian provinces, two Mexican states and three tribes (as of February 2008) to develop and manage a common North American greenhouse gas emissions reporting system. The registry is designed to provide an accurate, complete, consistent, transparent and verified set of greenhouse gas emissions data from reporting entities, supported by a robust accounting and verification infrastructure. The registry will become operational in July 2008. For more information, see www.theclimateregistry.org.

7. Business and NGO initiatives

In the absence of robust federal action, businesses and non-governmental organizations (NGOs) have developed myriad initiatives to address global warming. Interestingly, these efforts represent constituencies that have not historically been part of the climate discussion including African-Americans and Latinos, sportsmen, communities of faith, and youth. Three efforts in particular highlight the diverse coalitions being developed to achieve the support necessary for legislative action. The U.S. Climate Action Partnership has convened many of the nation's largest companies to call for a mandatory cap on GHG emissions. The Alliance for Climate Protection mobilizes the public at large to build grassroots political support for legislative action. Finally, several religious organizations have recognized the important role that social morality can play in encouraging an adequate response to climate change. Additional stakeholder efforts are discussed in Appendix C to help give an indication of the breadth of activities being pursued.

7.1 U.S. Climate Action Partnership[37]

One of the most high-profile efforts to impact GHG policy from the private sector has been the formation of the U.S. Climate Action Partnership, or USCAP. In its own words, USCAP is "an expanding alliance of major businesses and leading climate and environmental groups that have come together to call on the federal government to enact legislation requiring significant reductions of greenhouse gas emissions." The significance of this partnership is not only in the impact these companies have on the GDP of the U.S. (collectively, USCAP companies have total revenues of nearly $2 trillion and a combined market capitalization of more than $2.2 trillion)[38], but it is an important indication that significant parts of the private sector recognize a carbon-constrained economy is necessary and overall beneficial for the economy. As USCAP states on its website, "In our view, the climate change challenge will create more economic opportunities than risks for the U.S. economy."[39] The coalition, which includes 27 corporations and 6 NGOs, has set forth principles and recommendations for how legislation should be structured, an overview of which is provided below. More detailed information can be found at www.us-cap.org. In addition, the group has weighed in on specific proposals in recent climate legislation and offered its own recommendations related to energy efficiency and geologic carbon sequestration. More information on USCAP's policy recommendations is at http://www.us-cap.org/policystatements/index.asp.

USCAP Principles for GHG Legislation

- Account for the global dimensions of climate change;
- Create incentives for technology innovation;
- Be environmentally effective;
- Create economic opportunity and advantage;
- Be fair to sectors disproportionately impacted; and
- Reward early action.

USCAP Policy Design Recommendations*

- Congress needs to Enact Legislation as Quickly As Possible
- The Environmental Goal: stabilize emissions over the long term at a CO2 equivalent level between 450-550 ppm.
- Cap and Trade is Essential
- Establish Short and Mid Term GHG Emission Targets: between 100-105% of today's levels within 5 years of enactment, between 90-100% of today's levels within 10 years of rapid enactment, and between 70-90% of today's levels within 15 years of rapid enactment
- Complementary Policies and Measures Will be Necessary
- Scope of Coverage and Point of Regulation of the Cap and Trade Program: an "upstream" system that covers fossil fuel producers OR a "hybrid" approach that includes a downstream cap on stationary sources and an upstream cap on remaining sources
- Emissions Offsets: offsets should be allowed to count towards cap
- Emission Allowance Allocations: initial free distribution to capped sources and disadvantaged sectors; phase out free allocations to private sector over time
- Cost Control Measures: if used, designed to enable stable, long-term price signal high enough to drive low and zero-emission technologies
- Inventory and Registry: national emissions baseline must be established
- Credit for Early Action
- Technology Policy and Measures: a federal technology research, development, and demonstration and deployment program is needed
- Offsets should be allowed to count towards cap for some portion of a firm's compliance

* Adapted from *A Call For Action*, Design Recommendations

7.2 Alliance for Climate Protection

The Alliance for Climate Protection is a nonprofit organization chaired by former U.S. Vice President Al Gore. The mission of the organization is "to persuade the American people — and people elsewhere in the world – of the importance and urgency of adopting and implementing effective and comprehensive solutions for the climate crisis."[40] The organization will orchestrate a mass media campaign to this end; the organization's first major project was Live Earth, a 7-concert, 24-hour concert on 7/7/07 to raise awareness of the climate crisis and its solutions. For more information see www.climateprotect.org.

7.3 National Religious Partnership for the Environment and the Evangelical Environmental Network

Many religious organizations from a variety of faith perspectives have begun campaigns in the U.S. to raise awareness about the problem of global warming; in some cases, religious organizations are calling for specific types of legislation to address the issue. The result has been a phenomenon more akin to a movement than a series of campaigns. For more information about these religious organizations' activities on climate change, please see the National Religious Partnership for the Environment at www.nrpe.org and the Evangelical Environmental Network at www.creationcare.org/res/climate.

8. Major U.S. presidential candidate platforms

The United States will elect a new president in November 2008 to succeed President George W. Bush and assume office in January 2009. Early 2008 has seen a number of Presidential primaries, in which voters in each state vote for their desired candidate, and the process has narrowed the candidates down to three major candidates. Hillary Clinton and Barack Obama, both sitting U.S. Senators are the two remaining Democratic contenders and John McCain, also a U.S. Senator, is the presumptive Republican nominee. Each party will choose its candidate for the general election at their respective conventions in August (Democrats) and September (Republicans) 2008. All three candidates' public positions on climate-related policies are shown in Appendix B.

A number of observations are notable. First, John McCain was the only Republican in the once-wide Republican field to speak often and urgently about the issue of global warming. He is unique in the Republican Party in that he has introduced flagship legislation (with the 2000 Democratic Vice Presidential nominee, Senator Joseph Lieberman) that would reduce emissions by 60%, and he has held high-profile hearings on the issue. He speaks about the issue using the phrases "global warming" and climate change" rather than "energy security," the nomenclature used by most in his party to refer to the need to reduce our use of imported oil and gas.

Both Senators Clinton and Obama have supported proposed legislation that would reduce GHG emissions 80% by 2050. Senator McCain has not supported this legislation.

Appendix A: Federal greenhouse gas cap-and-trade proposals of the 110th Congress[41]

Bill	Scope of Coverage	Calculated U.S. emissions relative to 1990[42]	Offsets	Allocation	Other cost containment mechanisms	Additional measures
Lieberman-Warner S. 2191 America's Climate Security Act	All 6 GHGs Economy-wide, "hybrid" – upstream for oil refineries, natural gas processors and chemical producers / importers; downstream for coal	2020: 2 percent increase 2030: 14 percent decrease 2050: 45 percent decrease	15% limit on use of domestic offsets 15% limit on use of credits from international trading schemes	Increasing auction: 26.5% in 2012, rising to 69.5% in 2031 Specifies allocations to regulated entities (43% in 2012, phased out through 2030), states (10.5%), energy consumers (11 %) and agriculture and forestry (7.5%) among other categories	Borrowing up to 15% per company Creates Carbon Market Efficiency Board to allow for adjustments to caps on offsets, borrowing and interest rates	Funds and incentives for technology, adaptation and mitigating effects on poor Target subject to periodic NAS review Calls for border tax adjustments on carbon intense goods from countries without comparable policies by 2020
Bingaman-Specter S. 1766 – 7/11/2007 Low Carbon Economy Act	All 6 GHGs Economy-wide, "hybrid" – upstream for natural gas & petroleum; downstream for coal	2020: 18 percent increase 2030: 2 percent decrease 2050: 2 percent increase	Provides certain initial categories including bio sequestration and industrial offsets President may implement use of international offsets subject to 10% limit	Increasing auction: 24% from 2012-2017, rising to 53% in 2030 Some sector allocations are specified including: 9% to states, 53% to industry declining 2%/year starting in 2017 5% set-aside of allowances for agricultural	$12/ton CO2e "technology accelerator payment" (i.e., safety valve) starting in 2012 and increasing 5%/year above inflation Allows banking indefinitely	Bonus allocation for carbon capture and storage Funds and incentives for technology R&D Target subject to 5-year review of new science and actions by other nations Calls for border tax adjustments on carbon intense goods from countries without comparable policies by 2020
McCain-Lieberman S.280 – 1/12/2007 Climate Stewardship and Innovation Act	All 6 GHGs Economy-wide, "hybrid" – upstream for transportation sector; downstream for electric utilities & large sources	2020: 2 percent increase 2030: 15 percent decrease 2050: 42 percent decrease	30% limit on use of international credits and domestic reduction or sequestration offsets	Administrator determines allocation/auction split; considering consumer impact, competitiveness, etc.	Borrowing for 5-year periods with interest	Funds and incentives for tech R&D, efficiency adaptation, mitigating effects on poor

Bill	Scope of Coverage	Calculated U.S. emissions relative to 1990[42]	Offsets	Allocation	Other cost containment mechanisms	Additional measures
Sanders-Boxer S.309 – 1/16/2007 Global Warming Pollution Reduction Act	All 6 GHGs Economy-wide, point of regulation not specified	2020: 1990 levels 2030: 27 percent decrease 2050: 80 percent decrease	Includes provision for offsets generated from biological sequestration	Cap and trade permitted but not required. Allocation criteria includes transition assistance and consumer impacts	"Technology-indexed stop price" freezes cap if prices are high relative to tech options	Standards for vehicles, power plants, efficiency, renewables, certain categories of bio sequestration
Kerry-Snowe S.485 – 2/1/2007 Global Warming Reduction Act	All 6 GHGs Economy-wide, point of regulation not specified	2020: 1990 levels 2030: 22 percent decrease 2050: 62 percent decrease	Includes provision for offsets generated from biological sequestration No international leakage provisions	Determined by the President; requires unspecified amount of allowances to be auctioned	Not specified	Funds for tech. R&D, consumer impacts, adaptation Standards for vehicles, efficiency, renewables, certain categories of bio sequestration
Olver-Gilchrest H.R. 620 Climate Stewardship Act	All 6 GHGs Economy-wide, "hybrid" – upstream for transportation sector; downstream for electric utilities & large sources	2020: 3 percent increase 2030: 16 percent decrease 2050: 49 percent decrease	15% limit on use of international credits and domestic reduction or sequestration offsets	Administrator determines allocation/auction split; considering consumer impact, competitiveness, etc.	Borrowing for 5-year periods with interest	Funds and incentives for tech R&D, efficiency adaptation, mitigating effects on poor
Waxman H.R.1590 – 3/20/2007 Safe Climate Act of 2007	All 6 GHGs Economy-wide	2020: 1990 levels 2030: 27 percent decrease 2050: 80 percent decrease	Not specified	Determined by the President; requires unspecified amount of allowances to be auctioned	Not specified	Standards for vehicles, efficiency, renewables

Appendix B: 2008 Presidential candidate climate/energy actions, positions, and plans

CANDIDATE	CLIMATE & ENERGY POSITIONS AND PROPOSALS								
	Carbon Cap and Targets	**RPS**	**Energy Efficiency**	**Fuel Efficiency**	**Coal**	**Biofuels**	**Nuclear**	**Cosponsorships/ History**	**Other Notes**
Hillary Clinton (D)	80% reduction by 2050 100% auction	25% by 2025	20% energy savings by 2020	55 mpg by 2030 fleet-wide Opposed 40 mpg in 2005 (supported in 2003)	All new coal power must have CCS Would fund 10 CCS demonstration projects Supports CTL investment if GHGs 20% below conventional fuels	RFS of 60 billion gallons by 2030 Advance biofuels (80% cut in GHG emissions) to make up an increasing percentage of the mandate over time	Opposes new subsidies Would "continue research" to lower costs and improve safety and disposal	Cosponsor of Sanders-Boxer (3 months after it was released, days after Biden) Cosponsor of Lieberman-McCain in 2007	Proposes Strategic Energy Fund ($50 billion over 10 years by taxing the "excess profits" of oil companies) to be invested in clean energy technologies (e.g., renewables, efficiency, clean coal, PHEVs, biofuels) Cut foreign oil imports by 2/3 by 2030 Create 5M jobs through clean energy production Carbon-neutral campaign as of April 2007 Opposes subsidies for GHG-intensive tech
Barack Obama (D)	80% reduction by 2050 100 percent auction	25% by 2025 30% fed gov RPS by 2020	50% energy efficiency increase by 2030	40 mpg by 2020 50 mpg fleetwide in 18 years	Does not support government ban on new coal power Supports CTL investment if GHGs 20% below conventional fuels	Proposes national low-carbon fuel standard (modeled after CA) to cut emissions by 5% by 2015 and 10% by 2020	Supports nuclear power expansion if waste, safety, and security concerns are addressed	Cosponsor of Sanders-Boxer (3 months after it was released, days before others) Cosponsor of Lieberman-McCain in 2007	Proposes all new buildings be carbon-neutral by 2030 Proposes incandescent phase out by 2014
John McCain (R)	Authored bill to reduce emissions 65% by 2050	Opposed 10% standard in 2005 Opposed 20% standard in 2002	General support (no targets)	Supports 35 mpg efficiency increase (opposed 40 mpg) In 2002, introduced 36 mpg by 2016	Supports clean coal development Supports coal gasification R&D funding	Supports biofuels but opposes subsidies for ethanol	Supports expansion of nuclear power	First high-profile Republican to address climate change (2003 bill with Lieberman) Reintroduced in 2005 and 2007 - cosponsors this year include Clinton and Obama	Has made climate change among top three campaign issues

Appendix C: Significant organizations and stakeholder processes

Stakeholder organization	Focus	Summary of activities	Website
Climate Protection	Climate education outreach	The Alliance for Climate Protection is a nonprofit organization chaired by former U.S. Vice President Al Gore. The mission of the organization is "to persuade the American people — and people elsewhere in the world – of the importance and urgency of adopting and implementing effective and comprehensive solutions for the climate crisis."[43] The organization will orchestrate a mass media campaign to this end; the organization's first major project was Live Earth, a 7-concert, 24-hour concert on 7/7/07 to raise awareness of the climate crisis and its solutions.	www.climateprotect.org
Apollo Alliance	Creating green jobs	The Apollo Alliance is a coalition of labor, environmental, business and community leaders working to promote an agenda of reducing U.S. dependence on foreign oil, clean energy and good jobs. The focus of its message has been that investment in clean energy can spur the U.S. economy while cutting GHG emissions. With its moniker inspired by President John F. Kennedy's visionary call for the U.S. to put the first man on the moon within a decade, the Apollo Alliance has proposed a ten-point clean energy agenda with economic analysis showing that it would create 3.3 million "new, high-wage jobs in manufacturing, construction, transportation, high tech, and the public sector," and outlined strategies for states, cities and campuses to pursue a clean energy agenda.	www.apolloalliance.org
Blue-Green Alliance	Promoting the coalition of labor and environmental priorities	The Blue-Green Alliance is a partnership between the Sierra Club and the United Steelworkers and other "blue" (labor) and "green" (environmental) organization, created in 2006 to promote a joint agenda with three priorities: global warming and clean energy, fair trade, and reducing toxics. The alliance is significant because it links two issues and organizations that historically have not been considered linked in U.S. discourse. The two grassroots organizations educate their members and others about the linkages between jobs, the economy and climate and encourage their members to advocate for policy changes. The Alliance works in the states of Michigan, Minnesota, Ohio, Pennsylvania, Washington and Wisconsin.	www.bluegreenalliance.org
CERES	Sustainable business	Ceres is a coalition of companies and investors, environmentalists, and public interest groups, whose mission is to "(i)ntegrat(e) sustainability into capital markets for the health of the planet and its people." CERES uses its active network to help companies address social and environmental issues such as climate change by improving corporate governance, corporate accountability and disclosure and sustainability reporting. One CERES project, the Investor Network on Climate Risk, a network of over 60 investors managing over $4 trillion in assets, was launched at the First Institutional Investor Summit on Climate Risk at the United Nations in November 2003. The group promoted better management of the physical (eg, weather), regulatory, litigation and competitive risks of climate change while looking for possible opportunities such as producing new products and services in a world increasingly focused on solutions to global warming.	www.ceres.org
Chicago Climate Exchange	Carbon-trading	The Chicago Climate Exchange is a legally binding trading system in which members commit to carbon reductions against a calculated baseline and buy or sell credits, depending upon whether they are ahead of	www.chicagoclimatex.c

Stakeholder organization	Focus	Summary of activities	Website
	market	their carbon reduction commitments (and thus would sell credits) or behind their commitments (in which case a member would buy credits to make up for its shortfall). Members commit to the CCX Emissions Reductions Schedule, in which members that join between 2003 and 2006 (Phase I members) committed to an annual 1% reduction against their baseline emissions, or their average annual emissions from 1998 – 2001, resulting in a 6% emissions decrease against their baseline by 2010. Members that join from 2007 – 2010 (Phase II members) commit to a slightly faster schedule of reductions, also getting them to a 6% reduction from their baseline (either the average of emissions from 1998 – 2001 or their emissions in 2000) by 2010. The tradable currency in the CCX is the Carbon Financial Instrument, or CFI, each of which represents 100 metric tons of CO_2e. CCX has developed an offsets programs in which parties can register to sell or buy offsets which are verified by third parties approved by the CCX.	om
Pew Center on Global Climate Change Business Environmental Leadership Council	Business leadership	The Pew Center on Global Climate Change has convened the Business Environmental Leadership Council, an association of 43 companies, representing 3.8 million employees and $2.8 trillion in market capitalization, that are focused on addressing the problem of climate carbon change. Member pursuing GHG reduction strategies in the areas of energy supply solutions, energy demand solutions, process improvements, waste management practices, transportation, sequestration and offsets solutions, and emissions trading and offsets. In addition, thirty-seven of the BELC companies have individual GHG reduction goals and are currently working to achieve them or set new goals.	http://www.pewclimate.org/companies_leading_the_way_belc.
Religious Communities	Climate change solutions	Many religious organizations from a variety of faith perspectives have begun campaigns in the U.S. to raise awareness about the problem of global warming; in some cases, religious organizations are calling for specific types of legislation to address the issue. The result has been a phenomenon more akin to a movement than a series of campaigns.	www.nrpe.org http://www.creationcare.org/res/climate
Step it up	Climate change solutions	Youth in the U.S. – and specifically youth on college campuses – have a long history of being agents of social change. Youth have played a key role in increasing awareness of climate change in a number of recent public events. In April and November 2007, college students and others participated in a "National Day of Climate Action," in which citizens held public rallies across the country urging Congress to "Step it Up" and produce an aggressive piece of legislation to curb GHG emissions. In addition, January 2008 saw a national teach-in called "Focus the Nation" at colleges, university, high schools, middle schools, places of worship, civic organizations and businesses on climate change.	www.stepitup2007.org www.focusthenation.org.
World Resources Insitute's Green Power Market Development Group	Corporate partnership for renewable energy	The Green Power Market Development Group is a commercial and industrial partnership dedicated to building corporate markets for renewable energy. Group members include Alcoa Inc., Dow, DuPont, General Motors, Georgia-Pacific LLC, Google Inc., IBM, Interface, Johnson & Johnson, FedEx Kinko's, NatureWorks LLC, Pitney Bowes, Staples, and Starbucks. Started by WRI in 2000 with a goal of deploying one gigawatt of renewable energy by 2010, the Group's work thus far has resulted in over 700 megawatts of new renewable power capacity, including some of the largest renewable energy purchases in the United States. The 700 megawatts attest to the Group's success in deploying innovative renewable technologies, creating new market opportunities, pioneering new financing techniques, and influencing	www.thegreenpowergroup.org

Stakeholder organization	Focus	Summary of activities	Website
		public policy. For more information see www.thegreenpowergroup.org.	
World Resources Institute U.S. Climate Business Group's Regional Workgroups	Regional corporate partnerships	WRI maintains three regional corporate workgroups in the Midwest, Northeast and most recently in the Southeast U.S. under the umbrella partnership entitled the U.S. Climate Business Group. These workgroups consist of Fortune 500 multi-national corporations headquartered in these three regions with the overall goal of developing winning strategies for companies to thrive in a carbon constrained economy. Partner companies meet quarterly in their respective regions to share best practices on GHG management, learn about new low-carbon technologies and discuss climate change policy developments at the regional, national and international level. WRI also works one on one with partners on their corporate climate change strategies and works to connect progressive partners with policymakers.	http://www.wri.org/project/us-climate-business.
U.S. Climate Action Partnership	Influence climate change legislation	One of the most high-profile efforts to impact GHG policy from the private sector has been the formation of the U.S. Climate Action Partnership, or USCAP. In its own words, USCAP is "an expanding alliance of major businesses and leading climate and environmental groups that have come together to call on the federal government to enact legislation requiring significant reductions of greenhouse gas emissions." The significance of this partnership is not only in the impact these companies have on the GDP of the U.S. (collectively, USCAP companies have total revenues of nearly $2 trillion and a combined market capitalization of more than $2.2 trillion)[44], but it is an important indication that significant parts of the private sector recognize a carbon-constrained economy is necessary and overall beneficial for the economy. As USCAP states on its website, "In our view, the climate change challenge will create more economic opportunities than risks for the U.S. economy."[45] The coalition, which includes 27 corporations and 6 NGOs, has set forth principles and recommendations for how legislation should be structured.	www.us-cap.org. In addition, the group has weighed in on specific proposals in recent climate legislation and offered its own recommendations related to energy efficiency and geologic carbon sequestration. More information on USCAP's policy recommendations is at http://www.us-cap.org/policystatements/index.asp.

9. Notes and references

[1] http://www.gcrio.org/OnLnDoc/pdf/nep.pdf,

[2] http://www.whitehouse.gov/news/releases/2007/05/20070531-9.html

[3] Eilperin, J. (April 6, 2006) [http://www.washingtonpost.com/wp-dyn/content/article/2006/04/05/AR2006040502150_pf.html "Climate Researchers Feeling Heat From White House"] *Washington Post*

[4] WRI, CAIT (2007). Total includes CO_2 emissions from energy use only.

[5] To quantify the varying capacities of GHGs to convert solar radiation into heat energy during their atmospheric "lifetimes" (i.e., the extent to which a GHG contributes to global warming), the Intergovernmental Panel on Climate Change (IPCC) developed a global warming potential (GWP) index. CO_2, which has an atmospheric residence time (or lifetime) of decades to centuries, by definition has a GWP of 1; CH_4 has a GWP value of 21, or 21 times the global warming potential of CO_2; and N_2O has a GWP of 310, assuming 100-year time horizons (IPCC, 1996). The HFCs and PFCs have GWPs ranging from 140 to 11,700, and the GWP for SF_6 is 23,900 (IPCC, 1996). These "high-GWP" gases are emitted in much smaller quantities than other GHGs, so their impact, while still significant relative to the absolute quantity emitted, is comparatively less. Emissions of non-CO_2 gases (i.e., CH_4, N_2O, F-gases) are commonly expressed in terms of "CO_2 equivalents," to account for their different GWPs relative to CO_2

[6] There is still considerable debate as to whether or not China's annual emissions total has already surpassed that of the U.S. The IEA numbers presented here, while robust, are but one estimate of annual emission totals.

[7] EIA (2007b).

[8] The EIA reference case "reflects a scenario where current laws and policies remain unchanged throughout the projection period." It assumes a mid-range projection of economic and population growth.

[9] http://www.pewclimate.org/policy_center/analyses/response_bushpolicy.cfm

[10] Pew Research Center for People and the Press, http://people-press.org/reports/display.php3?ReportID=303

[11] ABC News/Washington Post/Stanford University Poll. April 5-10, 2007 and Newsweek Poll conducted by Princeton Survey Research Associates International. Aug. 1-2, 2007, http://www.pollingreport.com/enviro.htm

[12] http://energycommerce.house.gov/Climate_Change/

[12] CAIT-US

[13] EPA (2007). U.S. Inventory of Greenhouse Gas Emissions and Sinks 1990-2005.

[15] http://www.ucsusa.org/assets/documents/clean_vehicles/UCS-HR6-CAFE-Summary-Benefits.pdf

[16] Plants at the Pump, P. 30

[17] http://www.eere.energy.gov/afdc/fuels/stations_counts.html

[18] Searchinger, Timothy et al. "Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land Use Change." *Science* 29 February 2008. DOI: 10.1126/science.1151861 and Fargione, Joseph et al. "Land Clearing and the Biofuel Carbon Debt." *Science* 29 February 2008: Vol. 319. no. 5867, pp. 1235 – 1238. DOI: 10.1126/science.1152747

[19] http://www.aceee.org/press/0712energy-bill-2.htm

[20] http://www.aceee.org/energy/national/07nrgleg.htm

[21] For presentation purposes, biomass here includes landfill gas, municipal solid waste, agricultural byproducts and the like, according to the Energy Information Administration's operational definition. However this definition is not necessarily consistent with that of WRI.

[22] EIA, 2007.

[23] American Wind Energy Association

[24] Preferable definitions of biomass include some forest-related resources, agricultural waste, plants grown on already converted land, plants grown exclusively as fuel for electricity production, untreated solid wood waste, and biomass portions of co-fired power. For more information about preferable definitions, see RES Standard FS at http://www.wri.org/publication/national-renewable-electricity-standard-design-features. For more information on how states define renewable biomass, see http://go.ucsusa.org/cgi-bin/RES/state_standards_search.pl?states=All&category3=&category7=&category8=24&category32=&category39=&category43=&category51=&submit8.x=28&submit8.y=9

[25] Preferable definitions of hydropower include ocean wave, current or tide power; low impact hydro; and incremental hydro. For more information on preferable definitions, see RES Standard FS at http://www.wri.org/publication/national-renewable-electricity-standard-design-features For more information on how states define renewable hydroelectric power, see http://go.ucsusa.org/cgi-bin/RES/state_standards_search.pl?states=All&category3=&category7=&category8=25&category32=&category39=&category43=&category51=&submit8.x=17&submit8.y=8

[26] www.dsireusa.org

[27] http://www.ucsusa.org/clean_energy/clean_energy_policies/res-at-work-in-the-states.html

[28] http://yosemite.epa.gov/opa/admpress.nsf/eebfaebc1afd883d85257355005afd19/41b4663d8d3807c5852573b6008141e5!OpenDocument

[29] http://www.arb.ca.gov/cc/ccms/ab1493_v_cafe_study.pdf

[30] GHG emission totals from Canadian Provinces participating in the Midwest Accord and WCI are not included here. $MtCO_2e$ is million tonnes (metric tons) of carbon dioxide equivalent. Percentages are of total U.S. emissions.

[31] There are various clarifying definitions (of what generators qualify as fossil fuel-fired, etc) that are beyond the scope of this document but can be found at http://www.rggi.org/docs/program_summary_10_07.pdf

[32] For more detail on any aspect of the RGGI carbon trading budget, see http://www.rggi.org/docs/program_summary_10_07.pdf

[33] The nine design principles can be found at http://www.westernclimateinitiative.org/ewebeditpro/items/O104F13792.pdf on page 3

[34] Participating States and provinces include Illinois, Iowa, Kansas, Michigan, Minnesota, and Wisconsin (Indiana, Ohio, and South Dakota are observers) and Canadian province Manitoba

[35] http://www.midwesterngovernors.org/Publications/Greenhouse%20gas%20accord_Layout%201.pdf

[36] http://www.usmayors.org/climateprotection/agreement.htm

[37] USCAP members include: 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, Xerox Corporation

[38] http://www.us-cap.org/media/release_090607.pdf

[39] http://www.us-cap.org/background/index.asp

[40] www.climateprotect.org

[41] Adapted in part from "Economy-wide Cap-and-Trade Proposals in the 110th Congress", Pew Center on Global Climate Change, August 2007.

[42] Derived from Larsen, John; Heilmayr, Robert. "A Comparison of Legislative Climate Change Targets in the 110th Congress", World Resources Institute, December 2007.

[43] www.climateprotect.org

[44] http://www.us-cap.org/media/release_090607.pdf

[45] http://www.us-cap.org/background/index.asp