

Global Climate Change: Legal Summary

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THE FACTUAL CONTEXT

Introduction

In the first decade of the 21st century, climate change emerged as the most prominent environmental issue, both in the United States and around the world. In 1992, the U.S. signed a treaty, the United Nations Framework Convention on Climate Change (UNFCCC), that established a global structure for dealing with the problem. However, the U.S. refused to ratify the Kyoto Protocol, the principal agreement implementing the UNFCCC's goals. President George W. Bush acknowledged the problem of global warming but favored voluntary action and rejected mandatory controls. In reaction many states, acting either separately or in regional groups, adopted their own regulatory programs, as did many municipalities. Meanwhile, with the Democratic takeover of Congress after the 2006 election and the election of Barack Obama in 2008, the prospects for legislation -- and, failing that, vigorous administrative action -- seemed stronger than ever before. However, while comprehensive climate legislation passed the House of Representatives in June 2009, it died in the Senate. The November 2010 midterm election reestablished a Republican majority in the House and brought to Congress many members who are opposed to climate regulation. Thus it appears that 2011 will feature a battle between the Obama administration, which is exercising its existing authority under the Clean Air Act to regulate greenhouse gases, and those in Congress who wish to block this EPA action.

Global Temperatures and the Greenhouse Effect

The science and impacts associated with global warming have been recognized on a national and international level since the late 1980s. In 1988, the United Nations and the World Meteorological Organization appointed an international group of scientists to investigate global warming, calling the group the Intergovernmental Panel on Climate Change (IPCC).¹ The U.S. government recognized the IPCC as the preeminent international body established to provide objective scientific and technical assessments on global warming.² In February 2007, the White

¹ U.N. General Assembly Resolution 43/53 (1988).

² See S. Exec. Rep. No. 102-55, 102nd Cong., 2d Sess. at 3, 9 (Oct. 1, 1992) (explaining that IPCC's work is "viewed throughout most of the international scientific and global diplomatic

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House declared that the IPCC's work "captures and summarizes the current state of climate science research and will serve as a valuable source of information for policymakers. It reflects the sizeable and robust body of knowledge regarding the physical science of climate change, including the finding that the Earth is warming and that human activities have very likely caused most of the warming of the last 50 years."³ In April 2007, the United States Supreme Court approvingly cited the IPCC five times in its decision on climate change.⁴ In October 2007, the IPCC was awarded the Nobel Peace Prize, together with former Vice President Al Gore, for creating "an ever-broader informed consensus about the connection between human activities and global warming."

In 2007, the IPCC completed its Fourth Assessment Report (IPCC FAR) on global warming, the largest peer-reviewed scientific evaluation of climate change ever undertaken.⁵ The IPCC FAR made the following findings with respect to observed changes in climate and their effects:⁶

- "Eleven of the last twelve years (1995-2006) rank among the twelve warmest years in the instrumental period of global surface temperature (since 1850) . . . The temperature increase is widespread over the globe."
- "Rising sea level is consistent with warming... Global average sea level has risen since 1961 at an average rate of 1.8 [1.3 to 2.3] mm/yr and since 1993 at 3.1 [2.4 to 3.8 mm/yr], with contributions from thermal expansion, melting glaciers and ice caps, and the polar ice sheets."
- "Observed increases in snow and ice extent are also consistent with warming... Satellite data since 1978 show that annual average Arctic sea ice extent has shrunk by 2.7 [2.1 to 3.3]% per decade... Mountain glaciers and snow cover on average have declined in both hemispheres."
- "From 1900 to 2005, precipitation increased significantly in eastern parts of North and

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community as the *definitive statement* on the state-of-the knowledge about global climate change") (emphasis added).

³ White House Press Release, "Intergovernmental Panel on Climate Change Finalizes Report," Feb. 2, 2007, *available at* <http://www.whitehouse.gov/news/releases/2007/02/20070202.html>.

⁴ *Massachusetts v. Environmental Protection Agency*, 127 S. Ct. 1438, 1447 n.9 & 10, 1448, 1449, 1450, 167 L. Ed. 2d 248 (2007).

⁵ *See generally* The Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report (2007), *available at* <http://www.ipcc.ch>.

⁶ Intergovernmental Panel on Climate Change, "Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report," Nov. 16, 2007, at 1, *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

South America, northern Europe and northern and central Asia but declined in the Sahel, the Mediterranean, southern Africa and parts of southern Asia. Globally, the area affected by drought has likely increased since the 1970s.

Looking forward, the IPCC in November 2007 concluded that “[t]here is high agreement and much evidence that with current climate change mitigation policies and related sustainable development practices, global GHG emissions will continue to grow over the next few decades,” and that “[c]ontinued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21st century that would very likely be larger than those observed during the 20th century.”⁷

On a regional scale, the IPCC projected:⁸

- “[V]ery likely increase in frequency of hot extremes, heat waves, and heavy precipitation.”
- “[L]ikely increase in tropic cyclone intensity.”
- “[P]oleward shift of extra-tropical storm tracks with consequent changes in wind, precipitation, and temperature patterns.”
- “There is high confidence that by mid-century, annual river runoff and water availability are projected to increase at high latitudes (and in some tropical wet areas) and decrease in some dry regions in the mid-latitudes and tropics. There is also high confidence that many semi-arid areas (e.g. Mediterranean basin, western United States, southern Africa and northeast Brazil) will suffer a decrease in water resources due to climate change.”

The IPCC made these projections with specific reference to North America:⁹

- “Warming in western mountains is projected to cause decreased snowpack, more winter flooding, and reduced summer flows, exacerbating competition for over-allocated water resources.”
- “In the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5-20%, but with important variability among regions. Major challenges are projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources.”
- During the course of this century, cities that currently experience heatwaves are expected to be further challenged by an increased number, intensity and duration of heatwaves

⁷ *Id.* at 6.

⁸ *Id.* at 8.

⁹ *Id.* at 10.

during the course of the century, with potential for adverse health impacts.”

- “Coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution.”

The IPCC FAR found that a number of adaptation strategies may be necessary in order to cope with these projected changes in climate.¹⁰ For infrastructure and settlement, especially in coastal zones, the IPCC listed these options: “relocation; seawalls and storm surge barriers; dune reinforcement; land acquisition and creation of marshlands/wetlands as buffer against sea level rise and flooding; protection of existing natural barriers.” For the transportation sector, the IPCC identified “realignment/relocation; design standards and planning for roads, rail, and other infrastructure to cope with warming and draining.” For the energy sector, the IPCC enumerated “strengthening of overhead transmission and distribution infrastructure; underground cabling for utilities; energy efficiency; use of renewable sources; reduced dependence on single sources of energy.” For all of these measures, the IPCC called for integrating climate change considerations into planning and investment efforts.

Greenhouse Gases

The most important greenhouse gas (GHG) is carbon dioxide (CO₂). It is emitted in by far the greatest quantities. However there are other GHGs, and pound-for-pound they are more potent than carbon dioxide because they trap more energy. This potency is expressed as global warming potential (GWP). The other principal GHGs are methane, which has a GWP of 23 (meaning it is 23 times more potent than CO₂ on a ton-for-ton basis); nitrous oxide, with a GWP of 296; various types of hydrofluorocarbons, with GWPs ranging from 120 to 12,000; various perfluorocarbons, with GWPs ranging from 5,700 to 11,900; and sulfur hexafluoride, with a GWP of 22,200.¹¹

Two physical characteristics of all these GHGs are especially important. First, once emitted into the atmosphere, they travel around the globe; thus a ton of CO₂ that is emitted over New York has the same effect on climate change as a ton emitted over Paris, Shanghai or Honolulu. Second, most types of GHGs remain in the atmosphere for many decades.¹² Thus their emissions have a cumulative impact; this is unlike many other air pollutants which have primarily local or regional effects and which degrade within weeks or months.

Different countries emit far different quantities of GHGs. In 1990, the combined GHG emissions of China and India were 57% of the U.S. total. In 2000, the combined totals of China

¹⁰ *Id.* at 15.

¹¹ U.S. Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2004* (December 2005) at 12, based on IPCC Third Assessment Report.

¹² EIA 2004 at 13.

and India were about the same as that of the United States. In 2007, the International Energy Agency stated that China overtook U.S. in total CO₂ emissions.¹³

U.S. Emissions

When GWP is considered, these are the total U.S. emissions of GHGs in 2006 in million metric tons CO₂ equivalents:

U.S. Greenhouse Gas Emissions By Different End-Use Sector in 2006¹⁴ Million Metric Tons CO₂

¹³ International Energy Agency, *World Energy Outlook 2007* (2007).

¹⁴ EIA 2006 at 5.

Greenhouse Gas Emissions Overview
Greenhouse Gas Emissions in the U.S. Economy

Distribution of Total U.S. Greenhouse Gas Emissions by End-Use Sector, 2006					
Greenhouse Gas and Source	Sector				Total
	Residential	Commercial	Industrial	Transportation	
Million Metric Tons Carbon Dioxide Equivalent					
Carbon Dioxide					
Energy-Related (adjusted)	1,216.8	1,056.1	1,668.0	1,884.7	5,825.5
Industrial Processes	—	—	108.8	—	108.8
Total CO₂	1,216.8	1,056.1	1,776.8	1,884.7	5,934.4
Methane					
Energy					
Coal Mining	—	—	64.7	—	64.7
Natural Gas Systems	—	—	150.8	—	150.8
Petroleum Systems	—	—	21.1	—	21.1
Stationary Combustion	8.1	0.1	0.5	—	8.8
Stationary Combustion: Electricity	0.1	0.1	0.1	—	0.3
Mobile Sources	—	—	—	4.8	4.8
Waste Management					
Landfills	—	146.7	—	—	146.7
Domestic Wastewater Treatment	—	15.9	—	—	15.9
Industrial Wastewater Treatment	—	—	8.5	—	8.5
Industrial Processes	—	—	2.4	—	2.4
Agricultural Sources					
Enteric Fermentation	—	—	114.6	—	114.6
Animal Waste	—	—	56.2	—	56.2
Rice Cultivation	—	—	9.1	—	9.1
Crop Residue Burning	—	—	1.2	—	1.2
Total Methane	8.2	162.9	429.2	4.8	605.1
Nitrous Oxide					
Agriculture					
Nitrogen Fertilization of Soils	—	—	226.7	—	226.7
Solid Waste of Animals	—	—	61.7	—	61.7
Crop Residue Burning	—	—	0.6	—	0.6
Energy Use					
Mobile Combustion	—	—	—	54.8	54.8
Stationary Combustion	0.8	0.3	4.5	—	5.6
Stationary Combustion: Electricity	3.3	3.2	2.5	—	9.0
Industrial Sources	—	—	13.8	—	13.8
Waste Management					
Human Sewage in Wastewater	—	5.9	—	—	5.9
Waste Combustion	—	—	—	—	0.0
Waste Combustion: Electricity	0.1	0.1	0.1	—	0.4
Total Nitrous Oxide	4.3	9.6	309.9	54.8	378.6
Hydrofluorocarbons (HFCs)					
HFC-23	—	—	14.5	—	14.5
HFC-32	—	0.4	—	—	0.4
HFC-125	—	22.1	—	—	22.1
HFC-134a	—	—	—	66.1	66.1
HFC-143a	—	23.0	—	—	23.0
HFC-236fa	—	2.9	—	—	2.9
Total HFCs	0.0	48.4	14.5	66.1	129.0
Perfluorocarbons (PFCs)					
CF ₄	—	—	2.9	—	2.9
C ₂ F ₆	—	—	3.4	—	3.4
NF ₃ , C ₃ F ₈ , and C ₄ F ₈	—	—	0.6	—	0.6
Total PFCs	0.0	0.0	6.9	0.0	6.9
Other HFCs, PFCs/PFPEs					
Sulfur Hexafluoride (SF ₆)					
SF ₆ : Utility	4.5	4.3	3.3	—	12.2
SF ₆ : Other	—	—	3.4	—	3.4
Total SF₆	4.5	4.3	6.7	0.0	15.5
Total Non-CO₂	17.1	231.3	767.2	125.6	1,141.2
Total Emissions	1,233.8	1,287.4	2,544.0	2,010.3	7,075.6

Since 84% of the total U.S. emissions (as measured in GWP) are from CO₂, the sources of CO₂ emissions deserve special attention. The following table shows the sources of CO₂ emissions from the energy and industry sectors from 1990 to 2006:¹⁵

¹⁵ EIA 2006 at 11.

Table 4. U.S. Carbon Dioxide Emissions from Energy and Industry, 1990, 1995, and 1999-2006
(Million Metric Tons Carbon Dioxide)

Fuel Type or Process	1990	1995	1999	2000	2001	2002	2003	2004	2005	P2006
Energy Consumption										
Petroleum	2,172.0	2,199.6	2,407.3	2,452.0	2,464.0	2,461.5	2,506.9	2,597.1	2,614.8	2,581.2
Coal	1,799.7	1,897.5	2,051.2	2,144.9	2,083.6	2,092.7	2,130.1	2,154.6	2,162.4	2,134.1
Natural Gas	1,033.6	1,193.0	1,199.2	1,239.8	1,190.3	1,245.7	1,216.7	1,194.1	1,192.8	1,163.1
Renewables ^a	6.3	10.5	10.9	10.6	11.2	13.1	11.8	11.5	11.6	11.9
Energy Subtotal	5,011.6	5,300.6	5,668.6	5,847.2	5,749.1	5,813.0	5,865.5	5,957.4	5,981.6	5,890.3
Nonfuel Use Emissions ^b	98.8	105.5	125.0	110.8	105.8	106.2	104.2	112.1	107.3	111.5
Nonfuel Use Sequestration ^c	251.2	286.5	325.9	308.2	293.8	293.9	289.6	311.9	302.3	302.0
Adjustments to Energy	-82.4	-62.4	-66.5	-59.0	-44.0	-36.4	-27.3	-42.8	-43.8	-64.8
Adjusted Energy Subtotal	4,929.3	5,238.1	5,602.1	5,788.3	5,705.1	5,776.6	5,838.2	5,914.6	5,937.8	5,825.5
Other Sources	88.2	105.2	101.1	102.2	101.2	99.3	102.2	105.3	107.1	108.8
Total	5,017.5	5,343.4	5,703.1	5,890.5	5,806.3	5,875.9	5,940.4	6,019.9	6,045.0	5,934.4

^aIncludes emissions from electricity generation using nonbiogenic municipal solid waste and geothermal energy.
^bEmissions from nonfuel uses are included in the energy subtotal.
^cCarbon sequestered by nonfuel uses is included in the energy subtotal. Btu values are subtracted before emissions are calculated.
P = preliminary data.
Notes: Data in this table are revised from the data contained in the previous EIA report, *Emissions of Greenhouse Gases in the United States 2005*, DOE/EIA-0573(2005) (Washington, DC, November 2006). Totals may not equal sum of components due to independent rounding. Adjusted energy subtotal includes U.S. Territories but excludes international bunker fuels.
Source: EIA estimates.

The above tables highlight the importance of two particular activities to the U.S. emissions picture -- electricity generation and transportation. The generation of electricity created 28% of all the CO₂ from energy consumption in 2006. CO₂ from electricity generation increased 29% from 1990 to 2006. During this period, the amount of CO₂ from the burning of natural gas increased by 13%, from the burning of coal increased by 19%, and from the burning of petroleum increased by 19%.¹⁶

The transportation sector accounted for 34% of total U.S. energy-related CO₂ emissions in 2006. Almost all of this -- 98% -- is from the consumption of petroleum products. Specifically, 61% of total transportation sector emissions involve gasoline (automobiles and light trucks), 23% is diesel fuel (heavy trucks, locomotives, ships), and 12% is jet fuel. CO₂ emissions from petroleum use for transportation was 23% higher in 2006 than in 1990.¹⁷ In April 2010, the Department of Transportation issued a report that found that transportation accounted for 29% of total U.S. GHG emissions and 5% of total global emissions.¹⁸

The largest anthropogenic source of U.S. methane emissions is energy production -- mostly from coal mines and from petroleum and natural gas systems. Waste management (primarily landfills) and agriculture (mostly from domesticated animals) are also significant sources of methane.¹⁹ Nitrous oxide comes chiefly from agricultural activities, especially

¹⁶ *Id.*

¹⁷ EIA 2006 at 15.

¹⁸ The report, entitled *Transportation's Role in Reducing U.S. Greenhouse Gas Emissions*, is available at http://ntl.bts.gov/lib/32000/32700/32779/DOT_Climate_Change_Report_-_April_2010_-_Volume_1_and_2.pdf.

¹⁹ EIA 2006 at 21-25.

nitrogen fertilization and, to a lesser extent, the management of animal waste. Motor vehicles and certain industrial processes are also significant sources of nitrous oxide.²⁰ The other GHG gases -- hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride -- are used in numerous applications, such as solvents, refrigerants, firefighting, aerosol propellants, aluminum and semiconductor production, and in electrical equipment.²¹

Projecting the Future

In May 2007 the U.S. Energy Information Administration (EIA), part of the Department of Energy, published its *International Energy Outlook 2007*. It projected future worldwide CO₂ emissions based on a reference case that did not assume implementation of the Kyoto Protocol. These were the reference case projections:

World Carbon Dioxide Emissions²²

Billion Metric Tons	
Year	Projection
1990	21.2
2004	26.9
2010	30.9
2015	33.9
2020	36.9
2025	39.8
2030	42.9

Thus, EIA foresees more than a doubling of CO₂ emissions between 1990 and 2030. The EIA added that the Kyoto Protocol would only decrease worldwide emissions very slightly (from 43,676 MMT to about 43,000 MMT in 2030), largely because the largest emitters of carbon -- especially the United States and China -- were assumed not to participate in Kyoto's mandatory reductions (though even if the U.S. did participate, emissions would still grow drastically).

A report released by the U.K. government in October 2006 stated that the current stock of greenhouse gases in the atmosphere is equivalent to around 430 parts per million (ppm) CO₂, compared with only 280 ppm before the Industrial Revolution. According to the report, even if the annual flow of emissions did not increase beyond current rates, the level would reach 550 ppm by 2050; current rates of development could lead to a 550 ppm level as early as 2035. The report went on to say that stabilizing at or below a 550 ppm level would require global emissions to be around 25% below current levels by 2050. That level would lead to severe adverse

²⁰ EIA 2006 at 27-31.

²¹ EIA 2006 at 33-36.

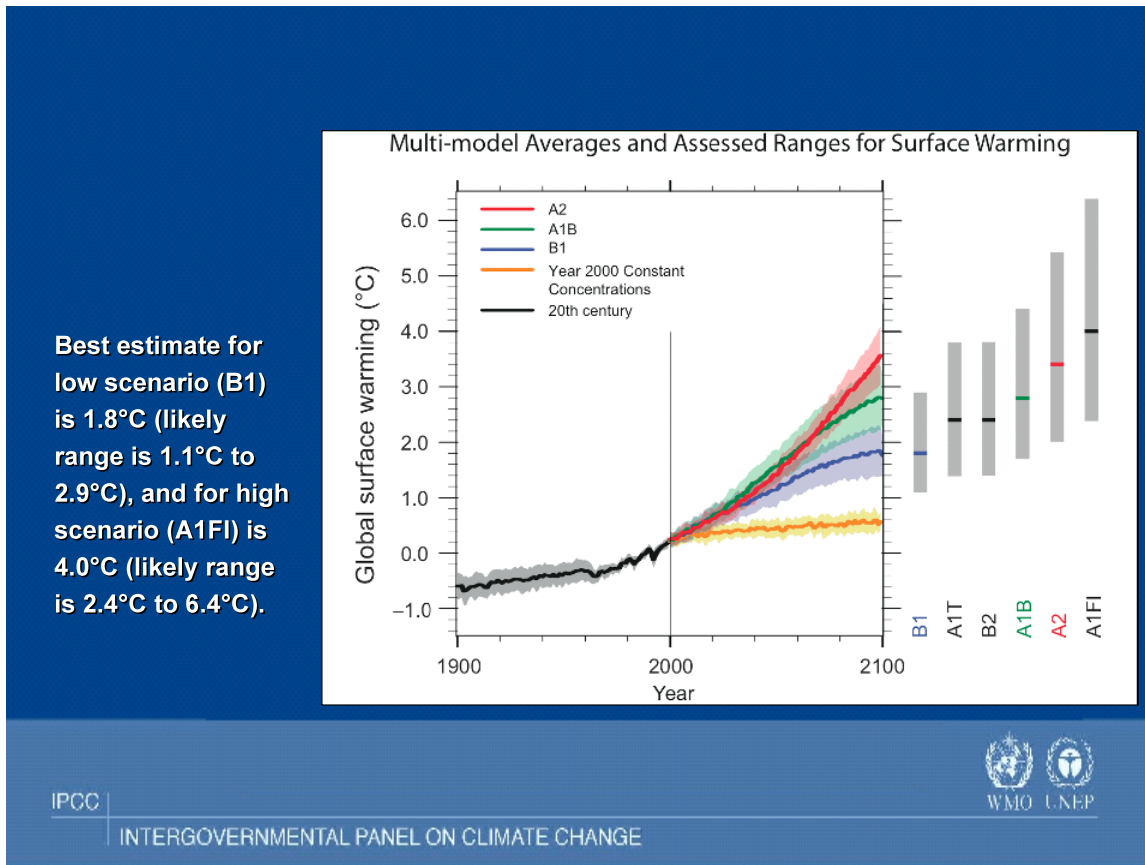
²² U.S. Energy Information Administration, *International Energy Outlook 2007* (May 2007), Ch. 7 Table 11.

environmental impacts. To stabilize at 450 ppm and thereby make the adverse effects less severe, global emissions would need to peak in the next ten years and then fall at more than 5% per year, reaching 70% below current levels by 2050.²³

In its 2007 Report,²⁴ the IPCC projected future levels of CO₂ in the atmosphere, and future temperatures, to the year 2100 using a variety of scenarios. The projections varied widely and are subject to considerable uncertainty and controversy. However, even the most optimistic scenarios yielded radically higher CO₂ levels and temperatures than now exist. For example, according to the IPCC, surface air temperatures would continue to rise for a century or more, while sea level would continue to rise for many centuries even if CO₂ emissions are stabilized. (As just noted, CO₂ emissions appear to be on their way to at least doubling, not stabilizing.) A graph charting these scenarios is set forth below. The lines represent different scenarios, with varying degrees of population growth, economic development, and introduction of clean and resource-efficient technologies. (The horizontal line at the bottom represents a continuation of current temperatures, which is physically impossible given the amount of greenhouse gas already in the atmosphere and being added to the atmosphere.) One notable feature of this graph is that the lines showing the global surface warming under different scenarios do not diverge much for any of the scenarios for another forty years or so. In other words, human efforts to control GHGs will have almost no effect on temperatures until the 2040s, though by the end of the century, human efforts will make a considerable difference.

²³ Stern Review, *The Economics of Climate Change* (HM Treasury, October 30, 2006), at iii, xi.

²⁴ International Panel on Climate Change, “Summary for Policymakers of the Synthesis Report of the IPCC Fourth Assessment Report,” Nov. 16, 2007, *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.



In September 2008, the Global Carbon Project released a report finding that the global concentration of CO₂ emissions has been increasing 3.5% a year since 2000, a rate of growth nearly four times what it was in the 1990s.²⁵ According to the report, atmospheric concentrations of CO₂ reached 383 ppm in 2007, a 37% increase over preindustrial levels and the highest concentrations in more than 650,000 years.

In November 2008, the U.N. World Meteorological Organization issued a similar report, finding that the average GHG growth rate was larger than the 1.5 ppm/year observed in the 1990s.²⁶ That same month, the IPCC stated that the 41 industrial nations most responsible for climate change increased their GHG emissions by 2.3% from 2000 to 2006. The report also stated that, of the 39 industrial nations that ratified the Kyoto Protocol and took on commitments under the agreement, only 16 were on pace to meet their target of cutting their GHG emissions by 5.2% by 2012 while 20 are not.²⁷

In December 2008, the Energy Information Agency reported that U.S. GHG emissions rose 1.4% in 2007.²⁸

²⁵ “Carbon Budget and Trends 2007 (Global Carbon Project 2008). A copy of this report is available at http://www.globalcarbonproject.org/carbontrends/index_new.htm.

²⁶ This report is available at <http://www.wmo.int/pages/prog/arep/gaw/ghg/GHGbulletin.html>.

²⁷ This press release is available at <http://unfccc.int/press/items/2794.php>.

²⁸ This report is available at <http://www.eia.doe.gov/oiaf/1605/flash/flash.html>.

In January 2009, the U.S. National Oceanic and Atmospheric Administration released a report finding that climate change is “largely irreversible” for the next 1,000 years even if CO₂ emissions were abruptly halted.²⁹ That same month, the EPA released a report finding that Mid-Atlantic region of the U.S. is likely to be greatly affected by sea level rise resulting from climate change.³⁰ These adverse effects could include submerging lowlands, eroding beaches and barrier islands, conversion of wetlands into open water, intensifying coastal flooding, and increasing salinity of estuaries and freshwater aquifers.

In February 2009, the EPA released a 2009 draft inventory report of U.S. greenhouse gas emissions. The draft inventory reported that overall U.S. emissions have risen by 17.1% from 1990 to 2007, including a 1.4% increase from 2006 to 2007.³¹

In March 2009, the International Scientific Congress on Climate Change issued a preliminary report stating that many of the worst case scenarios envisioned by the IPCC are in the process of being realized.³²

In June 2009, the Obama administration, in a joint venture with 13 federal agencies, released a report highlighting the effects of climate change on different regions of the United States. The report, entitled “Global Climate Change Impacts in the United States,”³³ was published by the United States Global Change Research Program (USGCRP). The report, which first reiterated that climate change is unequivocal and largely due to man-made greenhouse gas emissions, predicted what the United States could look like in 2100. Some of the predictions contained in the report include an average temperature increase of 4-11° F by 2100, more downpours, an increase in the number of days above 90° F for the Southeast, more droughts in the Southwest, sea level rise which could inundate southern Florida, and changing water supply patterns. The report concluded that the nation is already experiencing the effects of climate change and must act quickly to reduce GHG emissions.

In November 2009, the United Nations’ World Meteorological Organization released a report finding that global levels of CO₂, methane, and nitrous oxide reached record levels in

²⁹ This report, entitled “Irreversible Climate Change Due to CarbonDioxide Emissions” is available at <http://www.pnas.org/content/early/2009/01/28/0812721106.full.pdf+html>.

³⁰ This report, entitled “Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region,” is available at <http://downloads.climatechange.gov/sap/sap4-1/sap4-1-final-report-all.pdf>.

³¹ The draft inventory report is available at <http://epa.gov/climatechange/emissions/usinventoryreport.html>.

³² Information about the International Scientific Congress on Climate Change is available at <http://www.climatecongress.ku.dk>.

³³ The report is available at <http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts>.

2008. According to the report, CO₂ concentrations reached 385.2 parts per million (ppm) in 2008, 2.0 ppm higher than they were in 2007. Methane concentrations were 1,797 parts per billion (ppb) in 2008, up 7 ppb from 2007, and nitrous oxide levels were 321.8 ppb, up 0.9 ppb from 2008. In addition, atmospheric concentrations of other GHGs, including sulfur hexafluoride and hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) increased “at a rapid rate.”³⁴

In March 2010, EPA released a report finding that U.S. greenhouse gas emissions decreased by 2.9 in 2008 compared to 2007, but were 13.6 percent higher than 1990 levels.³⁵ The report attributes the decline in emissions to a variety of factors, including the economic downturn, an increase in energy prices, and a 7.1 percent increase in renewable energy electricity generations.

In April 2010, the Commerce Department released a report finding that, although U.S. GHG emissions from energy production increased from 1997 to 2007, the increase was smaller than it could have been because of increased energy efficiency.³⁶ The report found that during this time emissions intensity, which is the amount of emissions produced per dollar of output, improved from 533,000 metric tons of GHGs per \$1 billion in 1997 to 426,000 metric tons of GHGs per \$1 billion in 2007.

In May 2010, The National Academy of Sciences released three reports concluding that climate change is occurring and is caused primarily by human activities, recommending that the U.S. establish a GHG emissions budget, and recommending that the U.S. adopt an adaptation strategy to mitigate the impacts of climate change.³⁷

In July 2010, the National Oceanic and Atmospheric Administration (NOAA) released a report that found that the previous decade was the warmest on record.³⁸ The report found that the Earth warmed an average of one-fifth of a degree Fahrenheit per decade in the 20th century. In September 2010, the NOAA released a report finding that the summer of 2010 was the second warmest on record, with combined land and ocean temperatures averaging 61.3 degrees Fahrenheit for the June-August period, 1.15 degrees above the 20th century average of 60.1.³⁹

³⁴ The report is available at <http://www.wmo.int/pages/prog/arep/gaw/ghg/GHGbulletin.html>.

³⁵ This report, entitled “Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2008,” is available at <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>.

³⁶ The report, entitled *U.S. Carbon Dioxide Emissions and Intensities Over Time: A Detailed Accounting of Industries, Governments, and Households*, is available at <http://www.esa.doc.gov/co2>.

³⁷ The three reports are available at <http://americasclimatechoices.org>.

³⁸ The report, entitled *State of the Climate in 2009*, is available at <http://www.ncdc.noaa.gov/bams-state-of-the-climate/2009.php>.

³⁹ This report is available at http://www.noaanews.noaa.gov/stories2010/20100915_globalstats.html.

In November 2010, the World Meteorological Organization released a report finding that global concentrations of GHGs hit record levels in 2009, although the rate of growth was slower than in 2008.⁴⁰ The report found that the average concentration for carbon dioxide was 386.8 parts per million (ppm), the average for methane was 1,803 parts per billion (ppb), and the average for nitrous oxide was 322.5 ppb.

Possible Solutions

Methods to control GHG emissions generally fall into three categories: energy efficiency and conservation; renewable energy sources; and carbon sequestration.

Energy efficiency and conservation -- CO₂ emissions from vehicles are inversely proportional to fuel economy. Given the importance of the transportation sector in emissions, more stringent vehicle fuel economy standards are high on all lists of ways to reduce GHGs. So are more use of energy-saving technologies, such as hybrid vehicles, and less use of heavy and energy inefficient vehicles, such as sport utility vehicles (SUVs). Also frequently discussed, but requiring more decentralized effort over a much longer period of time, is changing land use patterns to reduce vehicle miles traveled by passenger vehicles and to increase trips by mass transit, bicycles and walking.

In the residential and commercial sectors, much effort is now being directed toward construction of “green buildings” that minimize the use of energy in heating, cooling, lighting, and other operations.⁴¹ Energy efficiency is also being pursued in home appliances and office equipment. Likewise, increased efficiency of many industrial operations has the potential to yield major reductions in GHG emissions. All in all, a wide variety of options are available to reduce energy consumption, many of them with net cost savings.⁴²

Renewable energy sources -- The use of renewable, low-carbon sources of energy such as wind, solar and biomass, is widely embraced, at least in theory. The substitution of natural gas for coal is generally popular, provided natural gas supplies are adequate. On the other hand, there continues to be major controversy over the idea of generating more electricity from nuclear power. An increasing number of environmentalists who have traditionally opposed nuclear power are growing to accept it more if the security and waste issues are resolved.

⁴⁰ This report is available at http://www.wmo.int/pages/mediacentre/press_releases/pr_903_en.html.

⁴¹ See C. Howe & M. Gerrard, eds., *The Law of Green Buildings* (Amer. Bar Ass’n/Env. Law Inst. 2010).

⁴² See McKinsey & Company, *Reducing U.S. Greenhouse Gas Emissions: How Much at What Cost?* (Dec. 2007), available at http://www.mckinsey.com/client-service/ccsi/pdf/US_ghg_final_report.pdf.

Carbon sequestration -- This emerging concept falls into two categories -- biological sequestration, and carbon capture and storage (CCS).

Biological sequestration uses the natural function of plants to take up carbon dioxide through photosynthesis. A portion of the carbon is then stored in plant biomass and in soil organic matter. The amount of CO₂ stored in natural systems can be increased through forest conservation and management, reforestation, agricultural practices that increase levels of soil organic matter, and conserving or creating certain kinds of wetlands. However, stored carbon can be released back into the atmosphere as a result of fires, decomposition, and land use changes. Storage through biological sequestration is also very difficult to measure. In October 2010, the U.S. Department of Agriculture released a report finding that U.S. forests absorb about 11 percent of annual industrial CO₂ emissions in the United States.⁴³

CCS uses engineered systems to capture carbon dioxide before it is emitted into the atmosphere, and then injects it into reservoirs for long-term storage. Much attention is now going to integrated gasification combined cycle, an emerging technology that helps capture CO₂ from power plants. Carbon capture technologies are also being developed for other industries, such as cement manufacture, oil refining, ammonia production, and iron and steel manufacture. Once the CO₂ is captured, it can be transported (usually by pipeline) to underground geologic formations; this may have the side benefit of enhancing oil and gas recovery from certain formations. The injection of CO₂ into the bottom of the oceans has also been proposed, but this raises environmental as well as legal concerns.

In July 2008, the EPA proposed new regulations addressing storage of CO₂.⁴⁴ The rules would establish a new class of injection wells for long-term CO₂ storage to EPA's Underground Injection Control Program under the Safe Drinking Water Act.⁴⁵ The new rules would establish a new class of underground injection control injection wells, Class VI, to regulate the geologic sequestration of CO₂ beneath the lowermost formation containing an underground source of drinking water.

In June 2009, the Department of Energy (DOE) announced that it would allocate over \$1.3 billion from the American Recovery and Reinvestment Act for large-scale industrial CCS projects.⁴⁶ DOE stated in the announcement that it was specifically targeting applications other than coal-fired electric power generation, which would be funded separately under its Clean Coal Power Initiative⁴⁷ and FutureGen Initiative.⁴⁸

⁴³ This report is available at <http://www.fs.fed.us/rmrs/forest-carbon>.

⁴⁴ 73 Fed. Reg. 43492 (July 25, 2008). The proposed rules are available at http://www.epa.gov/safewater/uic/pdfs/prefr_uic_co2rule.pdf.

⁴⁵ 42 U.S.C. § 300h.

⁴⁶ This announcement is available at <http://www.fossil.energy.gov/programs/sequestration/publications/arra/DE-FOA-0000015.pdf>.

⁴⁷ Information about this program is available at <http://fossil.energy.gov/programs/powersystems/cleancoal>.

In August 2009, DOE announced the selection of 19 projects to simulate, track and evaluate the potential risks of CCS in geologic formations. The projects' total value is \$35.8 over four years.⁴⁹

In February 3, 2010, President Obama announced in a presidential memorandum the establishment of an interagency task force charging with speeding up the development of technologies concerning CCS.⁵⁰ The chief mission of the task force is to provide a blueprint to enable five to ten commercial-scale demonstration projects for carbon sequestration to be up and running by 2016.

In November 2010, EPA finalized two rules that seek to address safety and emissions at CCS sites. The first rule establishes requirements for underground injection of carbon dioxide to ensure safety and prevent the carbon dioxide from causing underground contamination.⁵¹ The second rule requires GHG reporting from geologic carbon dioxide storage sites and from sites where carbon dioxide is used for enhanced oil recovery and other purposes.⁵²

Possible programs -- All agree that no one or two of the above measures will be nearly enough to stabilize GHG emissions; a combination of many approaches will be needed. In one well-known effort to describe a comprehensive program, two professors at Princeton University, Robert H. Socolow and Stephen W. Pacala, have listed 15 actions that could each, when phased in over 50 years, prevent the release of 25 billion tons of carbon. If seven of them were carried out, emissions would be frozen at their current levels for the next fifty years and then reduced by about half over the following fifty years.⁵³ These are the listed measures:

End-user efficiency and conservation

1. Increase fuel economy of two billion cars from 30 to 60 mpg

Footnote continued from previous page

⁴⁸ Information about this program is available at <http://fossil.energy.gov/programs/powersystems/futuregen>.

⁴⁹ Additional information about these projects is available at http://fossil.energy.gov/news/techlines/2009/09059-DOE_Selects_CO2_Monitoring_Project.html.

⁵⁰ This memorandum is available at <http://www.whitehouse.gov/the-press-office/presidential-memorandum-a-comprehensive-federal-strategy-carbon-capture-and-storage>.

⁵¹ 40 CFR Parts 124, 144, 145 and 146.

⁵² 40 CFR Parts 72, 78 and 98.

⁵³ Robert H. Socolow & Stephen W. Pacala, *A Plan to Keep Carbon in Check*, 295 *Scientific American* No. 3 at 50 (September 2006); S. Pacala & R. Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years With Current Technologies*, 305 *Science* 968 (August 13, 2004). See also Tony Dutzik & Emily Figdor, *Rising to the Challenge: Six Steps to Cut Global Warming Pollution in the United States* (U.S. PIRG Education Fund 2006).

2. Drive two billion cars 5,000 rather than 10,000 miles/year (at 30 mpg)
3. Cut electricity use in homes, offices and stores by 25%

Power generation

4. Raise efficiency at 1,600 large coal-fired plants from 40% to 60%
5. Replace 1,400 large coal-fired plants with gas-powered plants

Carbon capture and storage

6. Install CCS at 800 large coal-fired power plants
7. Install CCS at coal plants that produce hydrogen for 1.5 billion vehicles
8. Install CCS at coal-to-syngas plants

Alternative energy sources

9. Add twice today's nuclear output to displace coal
10. Increase wind power 40-fold to displace coal
11. Increase solar power 700-fold to displace coal
12. Increase wind power 80-fold to make hydrogen for cars
13. Drive two billion cars on ethanol, using one sixth of world cropland

Agriculture and forestry

14. Stop all deforestation
15. Expand conservation tillage to 100 percent of cropland

THE LEGAL CONTEXT⁵⁴

The International Context

[1] The UNFCCC and the Kyoto Protocol

The United Nations Framework Convention on Climate Change (UNFCCC) is the international agreement underlying this field. It was opened for signature at the United Nations Conference on Environment and Development in Rio de Janeiro in 1992. The United States Senate ratified it on October 7, 1992, and President George H.W. Bush signed it less than a week later. It came into force in 1994 and now has 190 parties.

The UNFCCC states that developed and developing countries have “common but differentiated responsibilities and respective capabilities.” Its principal objective is “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system.” It established a Conference of the Parties (COP) -- a legislative-like body that meets annually and is charged with devising ways to implement the

⁵⁴ For a detailed discussion of these issues, see Michael B. Gerrard, ed., *Global Climate Change and U.S. Law* (American Bar Ass'n 2007).

UNFCCC's goals. At the COP meeting in Kyoto, Japan in 1997, the Kyoto Protocol was negotiated. The United States actively participated in these negotiations, and Vice President Al Gore played a central role. The Kyoto Protocol came into force in 2005 when it was ratified by Russia. As of December 2010, a total of 183 countries and other governmental entities had ratified it. Until November 2007, the United States and Australia were the only major industrialized countries that had not ratified the Kyoto Protocol. However, in November 2007, Australia elected a new Prime Minister, Kevin Rudd, and as one of his first official duties, he signed the Protocol on December 3, 2007, leaving the United States alone in this regard.

The Kyoto Protocol sets binding emissions limitations on the developed countries that have signed it. These limitations must be met during the period 2008-2012. They are set as designated percentage reductions from a 1990 baseline of each country's emissions. Different countries must meet different percentages; the figure for the U.S. was to be 7% below 1990 emissions. All in all, the Kyoto Protocol aimed to reduce emissions about 30% below what would have occurred under "business as usual." The six principal types of GHGs are covered -- CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride -- though everything is expressed in the form of "carbon dioxide equivalent" tons of GHG emissions.

Recognizing the difficulty of lowering emissions at a time when they would otherwise be increasing, the Kyoto Protocol is very flexible in the ways that countries could meet their emission reduction mandates. Each country makes its own decisions on how to reduce emissions. One possible mechanism is referred to as the International Emissions Trading System (IETS). Under this mechanism, developed country signatories can trade emissions among themselves. Thus, if Country A can reduce its GHG emissions by 100 tons at a lower cost than Country B can achieve the same emissions reduction, the two countries can enter into a transaction whereby Country B pays Country A a sum they agree upon; Country A spends the money on the emissions reduction, and Country B gets credit for an emissions reduction.

Two additional mechanisms under the Kyoto Protocol are the Clean Development Mechanism (CDM), in which a developed country invests in a project in a developing country, and Joint Implementation (JI), a similar system aimed primarily at countries "undergoing the process of transition to a market economy" -- that is, the former Soviet-bloc nations.⁵⁵ Countries are also allowed to band together and be treated as a unit; thus, the European Union has developed its own system within the overall Kyoto structure, with each country having its own emissions reduction mandate, and with a vigorous emissions trading program among European Union countries.

At the Conference of Parties held in Bali, Indonesia in December 2007, the signatory countries undertook the first extensive negotiations into the shape of an agreement to follow the expiration of the Kyoto Protocol's first commitment period in 2012. These discussions

⁵⁵ As of August 2007, there were 762 projects registered with the CDM Executive Board, including 268 in India (35.2%), 106 in China (13.9%), and 105 in Brazil (13.8%). See <http://cdm.unfccc.int>.

continued at the Conference of Parties in Poznan, Poland, in December 2008. The next such Conference was in Copenhagen, Denmark in December 2009.

In July 2008, the so-called “Group of 8” industrialized countries met in Japan to discuss ways of reducing GHG emissions. The G-8 countries agreed to seek a 50 percent reduction in worldwide GHG emissions by 2050. However, the agreement was nonbinding and it did not include a baseline year for reducing emissions, nor did it include any mid-term goals. In July 2009, the G-8 countries announced that they had committed to limiting the rise of global temperatures to no more than 2° C (3.6° F) above pre-industrial levels.⁵⁶ The G-8 countries also pledged to reduce their GHG emissions by 80 percent by 2050. However, the pledge was nonbinding, did not include a specific year for baseline emissions, and did not include any short-term goals. In addition, developing countries failed to accept an emission reduction target of 50 percent below 1990 levels by 2050.

Another separate international law regime that affects climate change is the international development assistance arena, which is attempting to introduce less-polluting energy technologies to developing countries. The World Bank, the Global Environment Facility, and other international financial institutions are participating, with financial assistance from developed countries.

[2] The 2009 Copenhagen Conference

The fifteen annual Conference of the Parties to the UNFCCC (COP 15) was held in Copenhagen, Denmark on December 7-19, 2009. In all, 193 countries participated, including approximately 120 heads of government or of state. For the preceding two years, international climate negotiations had aimed to secure a legally binding agreement in Copenhagen that would succeed the Kyoto Protocol. In the final few months before COP 15 these expectations were considerably dampened. In the end, COP 15 led to a non-binding political agreement among the world’s major emitting countries. Many observers believe the outcome was disappointing but neither shocking nor catastrophic; others take a more positive or more negative view. All agree that a great deal more work needs to be done.

On the morning of the conference’s last day, the talks seemed on the verge of collapse. President Obama arrived at about 9 a.m. that day and spent the next 13 hours in intense negotiations with other leaders, and in two speeches to COP 15’s plenary session. These talks led to a three-page document, called the Copenhagen Accord, that was negotiated among the leaders of the U.S., China, India, Brazil and South Africa.⁵⁷ The Copenhagen Accord was then

⁵⁶ In February 2010, the United Nations Environment Program released a paper entitled “How Close Are We to the Two Degree Limit?” that concluded that current commitments made in conjunction with lead to global greenhouse gas emissions of 48.8-51.2 gigatons of carbon dioxide per year, which is insufficient to keep global temperatures from rising more than 2 degrees Centigrade. This paper is available at <http://www.unep.org/pdf/PressReleases/temperature-briefing-21-02-10-final-e.pdf>.

⁵⁷ The Copenhagen Accord is available at <http://unfccc.int/home/items/5262.php>.

agreed to by most of the other participating countries, but five rejected it -- Bolivia, Cuba, Nicaragua, Sudan and Venezuela. Under the UNFCCC's procedural rules, unanimity is required. The document formally adopted by COP 15 merely "takes note" of the Copenhagen Accord rather than adopting it, and thus it is not legally binding. In March 2010, China and India formally agreed to have their names attached to the Copenhagen Accord.

These are the key provisions of the Copenhagen Accord:

1. The parties reaffirm the need to "urgently combat climate change," and agree that global temperature increases should be limited to 2 degrees Centigrade.
2. The parties agree that financial assistance should be provided to the least developed countries, small island developing states and Africa to help them adapt to climate change.
3. The parties have until January 31, 2010 to submit their domestic mitigation targets, actions and policies.
4. Implementation of these targets, actions and policies by the developed countries will be subject to monitoring, reporting and verification under rigorous and transparent procedures. Implementation by developing countries will be subject to domestic measuring, reporting and verification subject to "international consultation and analysis."
5. The developed countries collectively commit to an amount "approaching" \$30 billion for the period 2010-2012 to help developing countries with emissions mitigation, adaptation, and reduction in deforestation. The developed countries will also mobilize \$100 billion annually by 2020 for these purposes.

This final item -- providing substantial funds to the developing countries -- is a major accomplishment of COP 15. The relative contributions of different developed countries to these sums has not been decided. It appears that a significant portion of these funds may come from private sector purchases of offsets from developed countries under the Kyoto Protocol's Clean Development Mechanism or whatever succeeds it. There is concern, however, that some of the money will be at the expense of previously-provided international development assistance. Another important accomplishment is that the major emerging economies, most notably China, India and Brazil, have for the first time committed to take actions to reduce their emissions. These commitments are not always quantified emissions reductions; China, for example, has committed to a decrease in its emissions intensity (that is, amount of GHG emitted per unit of economic activity). But COP 15 did as a practical matter eliminate the distinction made by the Kyoto Protocol that the world is sharply divided between developed and developing countries, and only the former have obligations to reduce their GHG emissions.

The selection of a 2 degree Centigrade objective was highly controversial. Many of the small island states and some African nations objected that this degree of warming would drown them; they called for a 1.5 degree Centigrade objective. The Copenhagen Accord calls for a reassessment of this goal and other items in 2015 to reflect the latest science available at that time.

In the aftermath of COP 15, many feel that these annual conferences are too cumbersome to reach serious agreements, especially in view of the UNFCCC's unanimous voting rules that give a veto power to dissenting states, no matter how small. In January 2010, the Congressional Research Service released a report that looks at the 20 countries that emit the most greenhouse gases and suggests that it may be time for a new approach that looks at these countries and offers fast-developing countries more flexibility in how they cut emissions.⁵⁸ According to the report, these nations account for more than 75 percent of global emissions. But it appears likely that in the coming few years the most important talks will be among the small number of countries that collectively account for the great bulk of the world's GHG emissions. Meanwhile, the Kyoto Protocol remains in place. The first commitment period under Kyoto expires at the end of 2012, and thus discussions about Kyoto's future will continue.

Many in the carbon trading and renewable energy fields had hoped that COP 15 would lead to clear signals about the future growth of the international carbon trading and renewable energy markets. No such signals emerged, leaving a great deal of uncertainty. Another great uncertainty is how the U.S. Congress will react. President Obama had hoped to go to Copenhagen armed with Congressional support for serious emissions reduction targets. He was able to report that the U.S. House of Representatives had passed a bill calling for a 17% reduction in U.S. GHG emissions (2005 baseline) by 2020, and (in a legally non-binding way) he committed the U.S. to that goal, but he was unable say that the Senate would necessarily agree. In fact, the failure of the U.S. Senate to pass climate change legislation was seen as one of the two most important reasons why progress in Copenhagen was so limited. (The other was the general recalcitrance of China to make certain commitments.) One of the Senate's major concerns is that prior to COP 15, China had not committed to emissions reductions; it remains to be seen whether the commitments that China made at COP 15 will be seen as sufficient.

Substantial progress was made at COP 15 toward an agreement on reduction of emissions from deforestation and degradation (REDD), but further progress on this subject (and many other topics) had to wait until the Cancun Conference.

[3] The Cancun Conference

COP 16 was held in Cancun, Mexico from November 29 to December 10, 2010. The parties reached agreement in several areas that were not formally adopted during COP 15. Referred to as the "Cancun Agreements," the parties agreed to a series of agreements that recognize the need to make deeper cuts in GHG emissions, provide a foundation for forest protection, and to help developing countries adapt to climate change.⁵⁹

⁵⁸ The report, entitled "Greenhouse Gas Emissions: Perspectives on the Top 20 Emitters and Developed Versus Developing Nations," is available at http://assets.opencrs.com/rpts/RL32721_20081128.pdf.

⁵⁹ Text of the Cancun agreements is available at <http://unfccc.int/2860.php>.

Overall, the Cancun Agreements call for limiting the global rise in temperatures to 2 degrees Celsius (3.6 degrees Fahrenheit) compared with pre-industrial levels. The agreements also set a collective goal of reducing greenhouse gas emissions by 25 to 40 percent compared with 1990 levels by 2020 and recognized the need for countries to “raise the level of the emissions reductions” to achieve these goals. However, the agreements did not detail how these emissions reductions would be achieved, nor did they include any mechanism to ensure countries are cutting emissions. In addition, the agreements lacked any explicit acknowledgement that there is a significant gap between the pledged commitments from industrialized and developing countries to reduce emissions and the level of cuts needed to keep global temperatures from rising above 2 degrees Celsius.

The Cancun Agreements formally established a “Green Fund” to disburse the \$100 billion a year by 2020 to assist the most vulnerable poor countries with low-carbon development and in adapting to rising sea levels and other climate change effects. However, language requiring that the funding be new and not drawn from other foreign aid projects was absent from the final texts.

The agreements also establish a registry for developing nations to record pledges to reduce their emissions. Under the agreements, developing nations like China and India will have to measure and report their GHG emissions and submit the actions they take to address their emissions to independent verification. The agreements also call for verification of actions supported by international assistance, and progress reports on those actions every two years. Domestic efforts by rapidly developing nations that do not get such technical or financial assistance can be verified domestically.

The agreements also create the Reducing Emissions from Deforestation and Degradation (REDD) forest protection program mentioned above. The agreement calls on the world’s nations to work together “to slow, halt, and reverse forest cover and carbon loss.” It also sets policies for heavily forested developing nations such as Brazil and Indonesia to develop national strategies to protect forests. The REDD agreement allows for “subnational” actions by states, provinces, and other local governments to protect forestland. Those would be allowed to count toward a nation’s overall forest protection effort, at least in the initial years of the program.

COP 17 is scheduled for November 28 to December 9, 2011, in Durban, South Africa.

U.S. Policy

Though the Clinton Administration negotiated the Kyoto Protocol, there was little support in the Senate for ratification. During the Kyoto talks, the Senate, by a vote of 95-0, passed a resolution sponsored by Senators Robert Byrd and Chuck Hagel directing the government not to enter into any agreements under the UNFCCC that would “mandate new commitments to limit or reduce greenhouse gas emissions for the Annex I [developed country] Parties, unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same compliance period.” The Kyoto Protocol did not meet this standard. On March 13,

2001, less than two months after taking office, President George W. Bush expressly repudiated the Kyoto Protocol, primarily on the grounds that it exempts China and India from compliance, and would cause serious harm to the U.S. economy.

In 2002, the Bush Administration announced its alternative to implementing the Kyoto Protocol. The Administration argued that implementation of the Protocol could put millions of Americans out of work and undermine the country's ability to make long-term investments in clean energy. Under President Bush's approach, a goal was set of reducing "greenhouse gas intensity" by 18 percent over 10 years.⁶⁰ Greenhouse gas intensity is the ratio of greenhouse gas emissions to economic output. The Bush Administration's goal was to lower the rate of emissions per million dollars of gross domestic product. However, prior to the financial crisis of 2008, the U.S. economy had been growing at a faster rate than 18% over eleven years, and thus total U.S. GHG emissions continued to grow under this policy. In March 2008, EPA released a draft report finding that, as of 2006, GHG emissions had increased by 14.1 percent since 1990.⁶¹

In September 2007, President Bush hosted a climate summit for the world's seventeen top GHG-emitting nations.⁶² At the summit, the President called on the heads of state of these nations to finalize long-term goals for reducing global greenhouse gas emissions and to establish systems for measuring progress. Under the President's plan, each nation would design its own strategy for achieving this goal taking into account that country's energy resources, stages of development, and economic needs. However, the summit did not establish binding GHG emission cuts.⁶³ At the Convention of Parties to the UNFCCC in Bali, Indonesia in December 2007, the United States again refused to agree to binding emissions reductions.

Under the Bush Administration, the U.S. had numerous programs to inventory GHGs (one of the requirements of the UNFCCC) and to conduct research in climate change and the technologies to control it. There were tax incentives for renewable energy and energy efficiency (as well as for conventional fossil energy). Another Bush Administration initiative was the Asia-Pacific Partnership on Clean Development and Climate.⁶⁴ It included the U.S., South Korea, India, China, Australia and New Zealand, which collectively account for approximately half of global GHG emissions. This program provided a voluntary framework for international cooperation to facilitate development and transfer of clean technologies and practices among the partner countries.

⁶⁰ White House, "President Bush Announces & Global Climate Change Initiatives" (Feb. 14, 2002).

⁶¹ EPA, Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006, *available at* <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>. The report showed a 1.5 percent decrease in GHG emissions in 2006 and stated that this decrease was largely due to a warm winter and cool summer, rising fuel prices, and the use of more renewable energy sources.

⁶² A fact-sheet about the summit is available at <http://www.whitehouse.gov/news/releases/2007/09/20070928-1.html>.

⁶³ See http://environment.independent.co.uk/climate_change/article3001650.ece.

⁶⁴ See <http://www.asiapacificpartnership.org>.

On December 19, 2007, President Bush signed into law the Energy Independence and Security Act of 2007.⁶⁵ Among other things, the law requires setting a corporate average fuel economy (CAFE) standard of 35 miles per gallon by 2020. It also requires increasing the supply of alternative fuel sources by requiring fuel producers to use at least 36 billion gallons of biofuel by 2022, from 4.7 billion gallons in 2007. It also contains other energy efficiency standards for buildings and appliances.

In October 2007, Senators Joe Lieberman and John Warner introduced the Climate Security Act (S. 2191).⁶⁶ In December 2007, the bill was reported favorably out of the Senate Environment and Public Works Committee and went to the full Senate. The bill, if passed, would establish a national “cap and trade scheme for GHG emissions. Covered facilities would be allocated a limited number of GHG emission allowances. From 2012 onward, the federal government would annually reduce the overall number of available allowances for distribution. The bill aimed to cap GHG emissions at 2005 levels by 2020 and reduce emissions by 70% below 2005 levels by 2050. The bill was brought up for debate on the Senate floor in June 2008. Opponents of the bill charged that it would damage the U.S. economy and drive up gasoline and other energy prices. The bill failed to reach final consideration when it fell 12 votes short of the 60-vote threshold necessary to overcome a promised Republican filibuster.

During the 2008 presidential campaign, Senator Barack Obama called for a cap-and-trade system that reduces CO₂ emissions 80% below 1990 levels by 2050, and stated that he favored auctioning emission allowances.⁶⁷ After his inauguration, President Obama repeated his call for a cap-and-trade system and an 80 percent reduction on GHG emissions by 2050.⁶⁸

In November 2008 at the Governors’ Global Climate Summit, then President-elect Obama stated that his administration will invest \$15 billion each year to encourage the development of clean energy technologies like solar power, windpower and new forms of biofuels. In February 2009, the U.S. Congress passed the American Recovery and Reinvestment Act, which includes \$30 billion in direct spending and \$20 billion in tax incentives for various renewable energy incentives.⁶⁹

In March 2009, then-Chairman of the House Energy and Commerce Committee Henry Waxman released a draft climate and energy bill which proposes a 20% cut in CO₂ emissions by 2020 from 2005 levels and an 83% cut in emissions by 2050. The draft bill, called the “American Clean Energy and Security Act of 2009,” achieves these cuts through an economy-

⁶⁵ Pub. L. No. 110-140, 121 Stat. 1492 (Dec. 19, 2007).

⁶⁶ Lieberman-Warner Climate Security Act of 2007, S. 2191, 110th Cong. (2007).

⁶⁷ *The Candidates and Climate Change, A Guide to Key Policy Positions* (Pew Center on Global Climate Change), available at <http://www.pewclimate.org/voter-guide>.

⁶⁸ See http://www.whitehouse.gov/agenda/energy_and_environment.

⁶⁹ Pub. L. No. 111-5 (Feb. 17, 2009).

wide “cap and trade” system that would require industries to hold allowances for each ton on greenhouse gas that they emit.⁷⁰ The bill did not address how the revenues raised by the sale of those allowances would be divided. The bill also included a renewable energy mandate that would require electricity suppliers to obtain 25% of their power from renewable sources.

In June 2009, the U.S. House of Representatives approved the American Clean Energy and Security Act (H.R. 2454) by a vote of 219-212.⁷¹ The bill as passed by the House would cut U.S. GHG emissions by 17% by 2020 and 83% by 2050 from 2005 levels by establishing a cap-and-trade system, and it would also impose a renewable electricity standard on states. The Act included a 309-page manager’s amendment that, among other things, made changes to the bill’s renewable electricity standard, provide the Federal Energy Regulatory Commission authority over the siting of high-priority transmission lines in the West, direct the Secretary of Agriculture to establish an emissions offset program for agriculture and forests, and specifically exempt the agriculture and forestry sector from the bill’s emissions caps. It would also establish a renewable electricity standard for federal agencies.

In May 2010, Senators Kerry and Lieberman released the America Power Act, which, if enacted, would implement a cap-and-trade program that would reduce U.S. GHG emissions by 17 percent by 2020 and 80 percent by 2050. The bill is similar to the American Clean Energy and Security Act. Among other things, the bill would preempt state GHG cap-and-trade programs and exclude GHGs from regulation under the Clean Air Act.⁷² In July 2010, Senate Majority Leader Harry Reid declined to begin deliberations on the bill when it was clear that it did not have enough votes to survive a filibuster, effectively killing this bill as well as the American Clean Energy and Security Act.

Given the results of the mid-term elections in November 2010, which elected new members in both the House and Senate that are generally hostile to climate legislation, it is unlikely that similar legislation will be passed by either the House or Senate in 2011 or 2012.

On October 5, 2009, President Barack Obama signed Executive Order 13514 that sets sustainability goals for federal agencies and focuses on making improvements in their environmental, energy and economic performance. The Executive Order requires federal agencies to set a 2020 greenhouse gas emissions reduction target within 90 days; increase energy efficiency; reduce fleet petroleum consumption; conserve water; reduce waste; support sustainable communities; and leverage federal purchasing power to promote environmentally-responsible products and technologies. The Executive Order builds on and expands the energy reduction and environmental requirements of Executive Order 13423 by making reductions of greenhouse gas emissions a priority of the federal government, and by requiring agencies to

⁷⁰ This bill is available at http://energycommerce.house.gov/Press_111/20090331/acesa_discussiondraft.pdf.

⁷¹ H.R. 2454 is available at <http://www.climatecasechart.com>.

⁷² Information about this and other climate-related legislation is available at <http://www.law.columbia.edu/centers/climatechange>.

develop sustainability plans focused on cost-effective projects and programs. The Executive Order also requires agencies to meet a number of energy, water, and waste reduction targets, including: (1) a 30% reduction in vehicle fleet petroleum use by 2020; (2) a 26% improvement in water efficiency by 2020; (3) 50% recycling and waste diversion by 2015; (4) a requirement that 95% of all applicable contracts will meet sustainability requirements; (5) implementation of the 2030 net-zero-energy building requirement; (6) implementation of the stormwater provisions of the Energy Independence and Security Act of 2007, section 438; and (7) development of guidance for sustainable federal building locations in alignment with the Livability Principles put forward by the Department of Housing and Urban Development, the Department of Transportation, and the Environmental Protection Agency.⁷³

In December 2009, the U.S. Department of Agriculture (USDA) signed a Memorandum of Understanding with dairy producers to cut greenhouse gas emissions from the U.S. dairy sector by 25% by 2020.⁷⁴ USDA will do so by, among other things, enhancing marketing efforts of anaerobic digesters to dairy farmers, which convert waste products such as manure into electricity.

In January 2010, pursuant to the requirements of Executive Order 13514, President Obama announced a target for federal agencies to reduce their greenhouse gas emissions by 28 percent by 2020.⁷⁵

In February 2010, the U.S. Council on Environmental Quality (CEQ), the unit of the Executive Office of the President with responsibility for overseeing the NEPA process, issued a draft guidance on NEPA and climate change.⁷⁶ With respect to federal agencies, it calls for analysis both of the impact of the proposed action on greenhouse gas emissions, and the impact of climate change itself on the action. The guidance contains a key sentence: “if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO₂-equivalent GHG emissions on an annual basis, agencies should consider this as an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public.”⁷⁷ This level applies only to direct emissions. The guidance states that “[i]n assessing direct emissions, an agency should look at the consequences of actions over which it

⁷³ A copy of the Executive Order is available at http://www.whitehouse.gov/assets/documents/2009fedleader_eo_rel.pdf.

⁷⁴ This Memorandum of Understanding is available at http://www.usda.gov/documents/FINAL_USDA_DAIRY_GHG_AGREEMENT.pdf.

⁷⁵ This announcement is available at <http://www.whitehouse.gov/the-press-office/president-obama-sets-greenhouse-gas-emissions-reduction-target-federal-operations>.

⁷⁶ Draft Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions (“Draft Guidance on Climate Change”). This guidance is available at <http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf>.

⁷⁷ *Id.* at 1.

has control or authority.” However, if the threshold is crossed, CEQ also calls for quantification of the indirect GHG emissions. CEQ also calls for quantification of the cumulative emissions over the life of the project, and discussion of measures to reduce GHG emissions, including consideration of mitigation measures and reasonable alternatives. The guidance seeks a look at the quality of any mitigation proposed -- its permanence, verifiability, enforceability, and additionality.

On the same day that CEQ released this guidance it also released NEPA guidance on mitigation measures, requiring more explicit disclosure and tracking of mitigation commitments.⁷⁸ Thus, when an agency includes mitigation measures in its EIS, that may now become more enforceable.

With respect to alternatives, CEQ proposes that the analysis “should also consider applicable Federal, State or local goals for energy conservation and alternatives for reducing energy demand or GHG emissions associated with energy production.”⁷⁹ CEQ also specifies that “[a]mong the alternatives that may be considered for their ability to reduce or mitigate GHG emissions are enhanced energy efficiency, lower GHG-emitting technology, renewable energy, planning for carbon capture and sequestration, and capturing or beneficially using fugitive methane emissions.”

The guidance cites some established protocols for calculating direct emissions from industrial facilities. However, it does not specify how an agency is to quantify the emissions resulting from highways, rail lines, and other transportation infrastructure. With respect to the effects of climate change on the design of proposed actions and alternatives, CEQ says that “agencies should use the scoping process to set reasonable spatial and temporal boundaries for this assessment and focus on aspects of climate change that may lead to changes in the impacts, sustainability, vulnerability and design of the proposed action and alternative courses of action.”⁸⁰ CEQ points out that “[c]limate change can affect the environment of a proposed action in a variety of ways. For instance, climate change can affect the integrity of a development or structure by exposing it to a greater risk of floods, storm surges, or higher temperature. Climate change can increase the vulnerability of a resource, ecosystem, or human community.... For example, an industrial process may draw cumulatively significant amounts of water from a stream that is dwindling because of a decreased snow pack in the mountains or add significant heat to a water body that is exposed to increasing atmospheric temperatures.”⁸¹ CEQ says that “[a]gencies can use the NEPA process to reduce vulnerability to climate change impacts, adapt

⁷⁸ Draft Guidance for NEPA Mitigation and Monitoring (“Draft Guidance on Mitigation”). This guidance is available at <http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-mitigation-monitoring-draft-guidance.pdf>.

⁷⁹ Draft Guidance on Climate Change at 5.

⁸⁰ *Id.* at 2.

⁸¹ *Id.* at 6-7.

to changes in our environment, and mitigate the impacts of Federal agency actions that are exacerbated by climate change.”⁸²

One issue is explicitly left for another day. The guidance says that “[I]and management techniques, including changes in land use or land management strategies, lack any established Federal protocol for assessing their effect on atmospheric carbon release and sequestration at a landscape scale.”⁸³ CEQ has invited public comment on what protocols might be appropriate for NEPA analysis of proposed land and resource management actions, and on other aspects of the draft guidance, until May 24. The CEQ notice takes care to point out that consideration of climate change is not a new component of NEPA, but rather is “a potentially important factor to be considered within the existing NEPA framework.”⁸⁴

Clean Air Act and Motor Vehicle Emissions

Vigorous legal activity has swirled around the role of the Clean Air Act (CAA). The three key questions posed to date are:

- What authority does the CAA confer EPA to regulate climate change?
- If EPA does possess such authority, does it have a mandatory duty under the CAA to act?
- Does the CAA preempt state authority to regulate motor vehicle emissions of GHGs?

During the Clinton Administration, two successive EPA general counsel opined that EPA does have the authority under the CAA to regulate GHGs as “air pollutants.” Their successor under President George W. Bush took the opposite view.

As detailed below, lawsuits and administrative proceedings are pending on whether the CAA obligates EPA to regulate CO₂ from stationary sources such as electric power plants, and whether technology to capture CO₂ from power plants and sequester it geologically must be considered as part of Best Available Control Technology assessments.

A separate federal law, the Energy Policy and Conservation Act of 1975, established the Corporate Average Fuel Economy (CAFE) program. Fuel economy is directly related to carbon dioxide emissions; in fact EPA measures CO₂ emissions from vehicles in order to determine their compliance with the CAFE standards. In 2002, the California Assembly required adoption of state regulations to reduce GHG emissions from motor vehicles. This law was challenged by the auto industry on the grounds that it is preempted by the CAA and the Energy Policy and

⁸² *Id.* at 2.

⁸³ *Id.* at 4. In December 2009, EPA released a draft report entitled “An Assessment of Decision-Making Processes: The Feasibility of Incorporating Climate Change Information into Land Protection Planning.” See 74 Fed. Reg. 69335 (Dec. 31, 2009). The report is available at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=210027>.

⁸⁴ *Id.* at 11.

Conservation Act, and suffers various other deficiencies and it being actively litigated in a number of jurisdictions.

On December 19, 2007, President Bush signed the Energy Independence and Security Act of 2007. Among many other provisions, it strengthened fuel economy standards. The same day, EPA denied California's request for a waiver of federal emissions standards, thereby blocking California and other states from adopting emissions standards more stringent than those adopted by the federal government.

Litigation

Numerous lawsuits have been filed to address global climate change.⁸⁵ They fall into three broad categories: administrative law claims, common law claims, and public international law claims. These actions tend to face several related problems. Who has standing to assert injuries that affect the entire planet? What is the proper role of the courts, as opposed to the executive and legislative branches, in addressing climate change? What kind of relief can be ordered by the courts?

[1] Administrative Law Claims

The first category is administrative law claims where plaintiffs claim that existing statutes require agencies to take (or not take) certain actions.

[a] *Massachusetts v. EPA*

In 1999, the International Center for Technology Assessment (ICTA) petitioned EPA to regulate certain GHG emissions from new motor vehicles. This petition wound its way through the EPA process and was denied in 2003. The denial was challenged by the ICTA, 12 states, and others. The U.S. Court of Appeals for the District of Columbia upheld the denial in a split decision.⁸⁶

On April 2, 2007, the U.S. Supreme Court issued a 5-4 decision reversing the D.C. Circuit.⁸⁷ The majority decision was authored by Justice Stevens and joined by Justices Kennedy, Souter, Ginsburg and Breyer. The majority found that “[t]he harms associated with climate change are serious and well recognized,” and that EPA did not dispute the existence of a

⁸⁵ See chart entitled “Climate Change Litigation in the U.S.,” prepared by Michael B. Gerrard & J. Cullen Howe of Arnold & Porter LLP, available at <http://www.climatecasechart.com>. Persons wishing to be added to the list to receive e-mails with updates to the chart should send a request to cullen.howe@aporter.com.

⁸⁶ *Massachusetts v. EPA*, 415 F.3d 50 (D.C. Cir. 2005).

⁸⁷ *Massachusetts v. EPA*, 549 U.S. 497, 127 S. Ct. 1438 (2007).

causal connection between man-made greenhouse gas emissions and global warming.”⁸⁸ Addressing the plaintiffs’ standing, the Court declared that “[o]nly one of the petitioners needs to have standing to permit us to consider the petition for review,” and that a sovereign state, Massachusetts, was among the plaintiffs.⁸⁹ Petitioners’ uncontested affidavits showed that “the rise in sea levels associated with global warming has already harmed and will continue to harm Massachusetts. The risk of catastrophic harm, though remote, is nevertheless real.”⁹⁰ Though an EPA decision to regulate greenhouse gas emissions from new motor vehicles might have only a small benefit to the Massachusetts coastline, that is enough to confer standing. The Court found that EPA’s argument against standing “rests on the erroneous assumption that a small incremental step, because it is incremental, can never be attacked in a federal judicial forum.”⁹¹

With standing established, the Court turned to the merits. The Court said that it had “little trouble concluding” that the Clean Air Act authorizes EPA to regulate greenhouse gas emissions from new motor vehicles in the event that it forms a judgment that such emissions contribute to climate change. The Clean Air Act has a “sweeping definition” of “air pollutant” that “embraces all airborne compounds of whatever stripe.”⁹² According to the Court, “[r]ather than relying on statutory text, EPA invokes postenactment congressional actions and deliberations it views as tantamount to a congressional command to refrain from regulating greenhouse gas emissions.”⁹³ The Court also rejected EPA’s conclusion that even if it does have statutory authority to regulate greenhouse gases, it would be unwise to do so, finding that this “rests on reasoning divorced from the statutory text.”⁹⁴ The Court found that “[u]nder the clear terms of the Clean Air Act, EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do.”⁹⁵ It declared that “EPA has offered no reasoned explanation for its refusal to decide whether greenhouse gases cause or contribute to climate change,” and therefore its action was “arbitrary, capricious, . . . or otherwise not in accordance with law.”⁹⁶ The Court explicitly did not reach the question of whether on remand EPA must make an endangerment finding, or whether policy concerns can inform EPA’s actions in the event that it makes such a finding.⁹⁷

⁸⁸ *Id.* at 1455.

⁸⁹ *Id.* at 1453-54.

⁹⁰ *Id.* at 1458.

⁹¹ *Id.* at 1457.

⁹² *Id.* at 1460.

⁹³ *Id.*

⁹⁴ *Id.* at 1462.

⁹⁵ *Id.*

⁹⁶ *Id.* at 1463.

⁹⁷ *Id.*

Two dissenting opinions were filed – one by Chief Justice Roberts on standing, and one by Justice Scalia on the merits. Both dissenting opinions were joined by all four dissenting members (Chief Justice Roberts and Justices Scalia, Thomas and Alito). Chief Justice Roberts expressed alarm that the majority opinion was opening up standing too broadly. He said there was no basis for giving special solicitude to states as plaintiffs.⁹⁸ He declared that there was no evidence that Massachusetts was really losing coastal land as a result of climate change, or that such loss was caused by EPA’s failure to regulate greenhouse gases from motor vehicles, or that any injury it suffered would be redressed by a victory in this case.⁹⁹ Justice Scalia found no requirement in the Clean Air Act that the Administrator of EPA make a judgment about whether to regulate greenhouse gases, as opposed to deferring any decision.¹⁰⁰ He also found that EPA had looked at the science and reasonably concluded that there is too much scientific uncertainty to regulate greenhouse gases.¹⁰¹ Moreover, he disagreed with the majority’s reading of the term “air pollutant” in the Clean Air Act, and said that EPA’s judgment that greenhouse gases do not qualify should receive deference.¹⁰²

[b] EPA Rulemaking Following *Massachusetts v. EPA*

[i] Endangerment Finding

As of April 2008, EPA had not implemented any regulations under the Clean Air Act concerning greenhouse gases. That same month, a coalition of 18 states, 13 environmental nonprofit groups, and other related parties filed a petition in the District of Columbia Circuit to force EPA to make a decision on whether to regulate greenhouse gas emissions from motor vehicles under the Clean Air Act.¹⁰³ The petition requested an order requiring the EPA to act within 60 days. In June 2008, the D.C. Circuit denied the petition.

In July 2008, the EPA issued an Advance Notice of Proposed Rulemaking concerning the implementation of such regulations.¹⁰⁴ The Notice includes extensive analysis of the science related to climate change, technologies available for reducing greenhouse gas emissions, and the various statutory provisions that may be implicated by an endangerment finding under section 202 of the Clean Air Act. The Notice solicits public comment and information on a range of mobile and stationary source issues that could arise from a decision to regulate GHG emissions under the Clean Air Act.

⁹⁸ *Id.* at 1464-66.

⁹⁹ *Id.* at 1470.

¹⁰⁰ *Id.* at 1472-73.

¹⁰¹ *Id.* at 1474-75.

¹⁰² *Id.* at 1475-77.

¹⁰³ *Commonwealth of Massachusetts v. U.S. EPA*, No. 03-1361 (D.C. Cir., filed Apr. 2, 2008).

¹⁰⁴ 73 Fed. Reg. 44354 (July 30, 2008). The Notice is available at <http://www.epa.gov/climatechange/anpr.html>.

On April 17, 2009, EPA released a proposed finding that GHG emissions cause or contribute to air pollution that endangers public health and welfare—the so-called “endangerment finding” that allows EPA to regulate GHGs under the Clean Air Act.¹⁰⁵ The proposed finding was published in the Federal Register on April 24, 2009, which began a 60-day public comment period, ending June 23, 2009.¹⁰⁶ On December 7, 2009, EPA issued a final endangerment finding.¹⁰⁷

On January 21, 2010, Alaskan Senator Lisa Murkowski introduced a resolution calling for the Senate to strip the EPA of its authority to regulate greenhouse gas emissions under the Clean Air Act.¹⁰⁸ In June 2010, the resolution was defeated by a vote of 53-47.

In addition, a number of lawsuits were filed by states and industry groups on or before the February 16, 2010 deadline for challenging EPA’s endangerment finding.¹⁰⁹ On July 29, 2010, EPA denied 10 petitions challenging the validity of the climate science used as a basis for its endangerment finding, concluding that “climate science is credible, compelling, and growing stronger.”¹¹⁰

In December 2010, the D.C. Circuit denied motions to stay EPA’s regulations concerning greenhouse gases.¹¹¹ The order declared that the petitioners (several industry groups and states opposed to climate regulation) “have not shown that the harms they allege are ‘certain,’ rather than speculative, or that the ‘alleged harm[s] will directly result from the action[s] which the movant[s] seeks to enjoin.’” The order also directed that the cases challenging these regulations be scheduled for oral argument on the same day before the same panel.

[ii] Greenhouse Gas Reporting Rule

¹⁰⁵ The proposed finding is available at <http://epa.gov/climatechange/endangerment/downloads/GHGEndangermentProposal.pdf>.

¹⁰⁶ 74 Fed. Reg. 18886 (April 24, 2009).

¹⁰⁷ Information about the final endangerment finding is available at <http://www.epa.gov/climatechange/endangerment.html>.

¹⁰⁸ This resolution is available at http://murkowski.senate.gov/public/?a=Files.Serve&File_id=a4804b50-284a-4cab-8be0-3d537c9947ca.

¹⁰⁹ Information about these lawsuits is available at <http://www.climatecasechart.com>.

¹¹⁰ The petitions challenging the endangerment finding are available at <http://epa.gov/climatechange/endangerment/petitions.html>.

¹¹¹ *Center for Responsible Regulation v. EPA*, Index No. 09-1322 (D.C. Cir. Dec. 10, 2010), *available at* https://www.law.columbia.edu/null/download?&exclusive=filemgr.download&file_id=541780.

In March 2009, EPA released draft regulations proposing a mandatory greenhouse gas reporting program.¹¹² Under the proposed regulations, which total close to 600 pages, facilities annually emitting more than 25,000 metric tons of CO₂ would be required to begin collecting emissions data on January 1, 2010 and submit annual reports starting in 2011. EPA's regulations would apply to most stationary sources, including power plants, pulp and paper mills, and municipal landfills. Producers of coal, coal-based liquid fuels, petroleum products, and producers, importers and exporters of greenhouse gases would also be required to report. In addition, the regulations would require automobile, truck and engine manufacturers to report emissions from the engines they produce.

On September 22, 2009, EPA issued its Final Mandatory Reporting of Greenhouse Gases Rule. EPA estimates that the new program will apply to approximately 10,000 facilities and cover approximately 85% of all GHG emissions in the U.S. Reporting requirements begin on January 1, 2010. Initial reports, covering emissions during 2010, are due on March 31, 2011. Specific gases to be reported include CO₂, methane, nitrous oxide, hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. In general, suppliers of fossil fuels, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to EPA. However, certain categories are excluded, including electronics manufacturing, food processing, industrial landfills, coal suppliers, and wastewater treatment facilities. EPA estimated that, for the first year of reporting, the annualized costs of reporting for the private sector will be approximately \$115 million and that, for subsequent years, those costs will be reduced to \$72 million.¹¹³

On March 22, 2010, EPA proposed a rule that would collect emissions data from the oil and natural gas sector for sources that emit more than 25,000 tons annually, industries that emit fluorinated gases such as chlorofluorocarbons (CFCs), and from facilities that inject and store CO₂ underground for purposes of geologic sequestration or enhanced oil and gas recovery.¹¹⁴ Under the proposed rule, newly covered sources would begin collecting emissions data on January 1, 2011 with the first annual reports submitted to EPA on March 31, 2012. On November 10, 2010, EPA issued a final rule.¹¹⁵ The rule requires these facilities to collect this data starting January 1, 2011 and provide the first annual report to EPA by March 31, 2012.

¹¹² The draft regulations are available at <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

¹¹³ Additional information about the final rule is available at <http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

¹¹⁴ The proposed rule is available at <http://www.epa.gov/climatechange/emissions/proposedrule.html>.

¹¹⁵ 40 C.F.R. Part 98, Subpart W, *available at* <http://www.epa.gov/climatechange/emissions/subpart/w.html>.

On June 28, 2010, the agency issued a final rule regarding mandatory reporting from magnesium production, underground coal mines, industrial wastewater treatment facilities, and industrial landfills.¹¹⁶

On July 16, 2010, the Council on Environmental Quality (CEQ) released draft guidance on GHG reporting by federal agencies.¹¹⁷ The draft guidance establishes government-wide requirements for calculating and reporting GHG emissions resulting from federal agency operations. On October 6, 2010, CEQ released final guidance directing federal agencies and departments to begin calculating and reporting their annual greenhouse gas emissions.¹¹⁸

[iii] Stationary Sources

On September 30, 2009, EPA Administrator Lisa Jackson announced that EPA would draft rules to regulate the emission of GHGs from stationary sources. The proposed rule would govern how EPA applies the emissions control requirements under the “prevention of significant deterioration” (PSD) program to greenhouse gases. It would also apply Title V of the Clean Air Act, which requires major sources to obtain operating permits, to GHGs. The proposal would set a major source threshold of 25,000 tons per year of GHGs, measured in carbon dioxide-equivalent emissions. The proposal would apply to CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Approximately 14,000 large sources would need operating permits for GHG emissions under the Title V program.¹¹⁹

On February 22, 2010, Administrator Jackson, in a letter to federal lawmakers, announced that greenhouse gas regulations for large stationary sources will not go into effect until 2011.¹²⁰ She also announced that EPA is considering raising the threshold for which facilities above 25,000 tons per year.

On May 13, 2010, EPA released a final version of the PSD tailoring rule.¹²¹ The first phase of the rule begins on January 2, 2011, when sources that are otherwise major sources for non-GHG pollutants will be required to undergo PSD review for GHGs if they have a potential to emit 75,000 tons of carbon-dioxide-equivalent emissions. A major source which has obtained

¹¹⁶ The final rule is available at <http://www.epa.gov/climatechange/emissions/remaining-source-categories.html>.

¹¹⁷ The draft guidance is available at <http://www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg>.

¹¹⁸ This guidance is available at http://www.whitehouse.gov/sites/default/files/microsites/ceq/GHG%20Guidance%20Document_0.pdf.

¹¹⁹ Information about the proposed rule is available at <http://www.epa.gov/nsr/actions.html#sep09>.

¹²⁰ This letter is available at http://epa.gov/oar/pdfs/LPJ_letter.pdf.

¹²¹ The final rule is available at <http://www.epa.gov/NSR/documents/20100413final.pdf>.

a PSD permit before January 2, 2011 will not be subject to these requirements unless or until it applies for a PSD permit or modification. A second phase begins July 1, 2011, and will include sources that have the potential to emit 100,000 tons of carbon-dioxide-equivalent emissions, regardless of whether the source would otherwise be major for any other pollutant. Phase 3 entails a rulemaking process whereby EPA will seek comment on how to regulate smaller sources of GHGs, and will issue a final rule on or before July 1, 2012.

On August 12, 2010, EPA announced a proposed rule that 13 states are not in a position to carry out these new rules, and proposed another rule to carry out a federal implementation plan (FIP) that would allow the agency to directly issue PSD permits in these jurisdictions unless and until they submit adequate SIPs to EPA.¹²²

As mentioned above, all final EPA actions concerning the regulation of GHGs are currently being challenged by various industry associations in the D.C. Circuit.¹²³

On December 23, 2010, EPA announced that it had reached settlements concerning GHG emissions controls for power plants and petroleum refineries.¹²⁴ Pursuant to the agreement concerning fossil fuel-fired power plants, EPA must propose new source performance standards by July 26, 2011 and finalize them by May 26, 2012. Pursuant to the agreement concerning refineries, EPA must propose new source performance standards by December 15, 2011 and finalize them by Nov. 15, 2012.

[iv] Mobile Sources

California has enacted legislation regulating tailpipe emissions of CO₂ and other GHGs. In December 2005, it sought a waiver from the EPA under the CAA to adopt these standards. In November 2007, in response to the agency's failure to act on its waiver request, California filed a lawsuit seeking to compel the agency to do so.¹²⁵ The next month EPA denied the waiver, and California and other states vowed litigation to challenge the refusal.

On December 19, 2007, EPA Administrator Stephen Johnson denied California's request, stating that it did not meet the statutory requirements of Section 209.¹²⁶ Johnson's decision

¹²² These proposed rules are available at <http://www.epa.gov/NSR/actions.html>. The states are Alaska, Arizona (excluding Maricopa County, Pima County, and Indian County), Arkansas, California (Sacramento Air Quality Management District only), Connecticut, Florida, Idaho, Kansas, Kentucky, Nevada (Clark County only), Oregon, and Texas.

¹²³ A list of these lawsuits is available at <http://www.climatecasechart.com>.

¹²⁴ Information regarding these settlements is available at <http://www.epa.gov/airquality/ghgsettlement.html>.

¹²⁵ *State of California v. Environmental Protection Agency* (D.D.C. filed Nov. 8, 2007).

¹²⁶ A copy of this letter is available at http://ag.ca.gov/cms_attachments/press/pdfs/n1514_epa-letter.pdf.

marked the first time that EPA denied California a waiver to implement vehicle standards stricter than federal requirements. In response, California and others sued EPA in federal court.¹²⁷ In April 2008, the Ninth Circuit rejected a motion by the EPA to dismiss the suit on the grounds that it should be heard in the D.C. Circuit.¹²⁸ However, the Ninth Circuit granted a subsequent motion to dismiss in July 2008 on the grounds that the suit was premature given that it was filed in January 2008, two months before the EPA Administrator formally entered his decision denying the request for a waiver in the Federal Register.¹²⁹

On January 26, 2009, President Obama issued a Presidential Memorandum directing EPA Administrator Lisa Jackson to consider whether EPA's decision to deny the waiver was appropriate and to take appropriate action.¹³⁰ On April 17, 2009, EPA released a proposed finding that GHG emissions cause or contribute to air pollution that endangers public health and welfare--the so-called "endangerment finding" that allows EPA to regulate GHGs under the Clean Air Act.¹³¹

On June 30, 2009, EPA Administrator Lisa Jackson announced that she was granting California's request for a waiver of preemption of GHG emissions standards for new motor vehicles.¹³² In her decision, Administrator Jackson found that "Congress intentionally structured this waiver provision to restrict and limit EPA's ability to deny a waiver, and did this to ensure that California had broad discretion in selecting the means it determined best to protect the health and welfare of its citizens." She declared that her predecessor's denial "was a substantial departure from EPA's longstanding interpretation of the Clean Air Act's waiver provision and EPA's history of granting waivers to California for its new motor vehicle emissions program." She said that "if California needs a separate motor vehicle program to address the kinds of compelling and extraordinary conditions discussed in the traditional interpretation, then Congress intended that California could have such a program." The decision applies to

¹²⁷ *State of California v. Environmental Protection Agency*, No. 08-70011 (9th Cir. filed Jan. 2, 2008). A copy of this petition is available at http://ag.ca.gov/cms_attachments/press/pdfs/n1514_epapetition-1.pdf.

¹²⁸ *State of California v. Environmental Protection Agency* (9th Cir. Apr. 10, 2008) (unpublished). A copy of this decision is available at http://climate.alston.com/files/docs/Ninth_Circuit_Ruling.pdf.

¹²⁹ *State of California v. Environmental Protection Agency* (9th Cir. July 25, 2008) (unpublished). A copy of this decision is available at http://climate.alston.com/files/docs/ccn07252008_waiver.pdf.

¹³⁰ A copy of this memorandum is available at http://www.whitehouse.gov/the_press_office/California_Request_for_Waiver_Under_the_Clean_Air_Act.

¹³¹ The proposed finding is available at <http://epa.gov/climatechange/endangerment/downloads/GHGEndangermentProposal.pdf>.

¹³² The notice granting the waiver is available at <http://www.epa.gov/OMS/climate/ca-waiver.htm>.

automobiles and light trucks for the 2009 through 2012 model years, though Ms. Jackson said manufacturers would not be penalized if they did not meet it for model year 2009.

One of the difficulties that the automakers had faced is that they needed to meet three different sets of standards -- the federal emissions standards; the California emissions standards; and the federal fuel economy standards (which in effect limit emissions of CO₂). In May 2009, the Obama administration announced that it had reached an agreement with California and the automakers to merge all of these standards for model years 2012 through 2016 into one set of progressively tighter standards.¹³³ The new standards, covering model years 2012-2016, and ultimately requiring an average fuel economy of 35.5 mpg in 2016, will be proposed jointly by EPA and the National Highway Traffic Safety Administration. This limit surpasses the CAFE law passed by Congress in 2007 required an average fuel economy of 35 mpg in 2020.

On September 15, 2009, EPA Administrator Lisa Jackson officially announced the proposal, which would require cars and light trucks sold in model year 2016 to achieve an average of 35.5 mpg. According to the proposal, the proposed standards would cut CO₂ emissions by an estimated 950 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program.¹³⁴ On April 1, 2010, EPA issued its final rule regarding these standards, which require an increase in fuel economy in cars and light trucks to 35.5 mpg by model year 2016.

On May 21, 2010, in a Presidential Memorandum, President Obama directed EPA and the Department of Transportation to begin a rulemaking for first-ever fuel economy and GHG emissions standards for medium- and heavy-duty trucks. He also directed the federal agencies to develop new fuel economy and GHG emissions standards for cars and light trucks for model year 2017 and beyond.¹³⁵ On October 25, 2010, the Obama administration announced a proposal that would set standards for these trucks. The standards, if enacted, would apply to vehicles in model years 2014-18.¹³⁶

On October 1, 2010, the Obama administration announced that it would propose fuel economy standard for cars and light trucks of 62 miles per gallon for model years 2017-25.¹³⁷

¹³³ This announcement is available at http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy.

¹³⁴ Information about this proposal is available at <http://www.epa.gov/otaq/climate/regulations.htm>.

¹³⁵ The Presidential Memorandum is available at <http://m.whitehouse.gov/the-press-office/presidential-memorandum-regarding-fuel-efficiency-standards>.

¹³⁶ Information regarding this proposal is available at <http://www.epa.gov/otaq/climate/regulations.htm>.

¹³⁷ The Notice of Intent announcing this proposal is available at <http://www.epa.gov/otaq/climate/regulations/ldv-ghg-noi.pdf>.

[c]--Other Administrative Law Cases¹³⁸

[i] Federal Preemption

California's regulations have been the subject of several lawsuits.¹³⁹ In *Central Valley Chrysler-Jeep*, automobile dealerships sought declaratory and injunctive relief to prevent enforcement of the California Air Resources Board's (CARB) greenhouse gas emissions standards for motor vehicles, arguing that CARB's regulations are preempted by the Energy Policy and Conservation Act (EPCA), the CAA, the foreign policy and foreign affairs powers, and that the regulations violated the dormant Commerce Clause and the Sherman Act. The defendants filed a motion to dismiss. The court declined to dismiss the CAA preemption claim, finding that, although EPA may grant CARB a waiver from the CAA's express preemption of state regulation of motor vehicle emissions, EPA had not yet done so. In December 2007, the court upheld California's ability to regulate GHG emissions from mobile sources.¹⁴⁰ The court rejected claims that CARB's program was preempted by EPCA and foreign policy considerations. Relying on the language in *Massachusetts v. EPA*, the court concluded that EPA had authority to issue emission control regulations that have an effect on fuel economy and that EPCA did not preclude EPA from doing so. The court further held that there was no basis for treating a state regulation that has been granted a waiver under § 209 of the Clean Air Act any differently than an EPA-issued regulation.

In February 2008, the Ninth Circuit upheld an injunction enjoining CARB from enforcing state regulations that limit emissions from the auxiliary diesel engines of ocean-going vessels within 24 miles of California's coast, holding that § 209 required the state to seek a waiver from EPA.¹⁴¹ The court reasoned that because these regulations require that engines not emit more than a certain amount of a given pollutant, they are "emissions standards" and are therefore preempted by the CAA unless a waiver is granted.

Other states have adopted California's emissions standards. This has led to further lawsuits. In *Green Mountain Chrysler v. Crombie*,¹⁴² car dealers and manufacturers challenged Vermont's adoption of California's greenhouse gas regulations for passenger vehicles. Vermont, along with ten other states, had adopted California's proposed vehicle emission standards which require a 30% decrease in GHG emissions for new passenger cars and light trucks by 2016. Plaintiffs sought declaratory and injunctive relief, arguing that Vermont's regulations are

¹³⁸ Information about all of the lawsuits mentioned in this section is available at <http://www.climatecasechart.com>.

¹³⁹ *Central Valley Chrysler-Plymouth, Inc. v. Witherspoon* (E.D. Cal. filed Jan. 3, 2002); *Liberty Motors, Inc. v. ARB* (Cal. Super. Ct., Fresno Co. filed Jan. 3, 2002).

¹⁴⁰ *Central Valley Chrysler Jeep, Inc. v. Goldstone*, 529 F. Supp. 2d 1151 (E.D. Cal. 2007).

¹⁴¹ *Pacific Merchant Shipping Ass'n v. Goldstene*, 517 F.3d 1108 (9th Cir. 2008).

¹⁴² *See, e.g., Green Mountain Chrysler v. Dalmasse*, No. 2:05 Civ. 302 (D. Vt. filed Nov. 18, 2005).

preempted by the CAA and the EPCA. A trial was held in April 2007. In September 2007, the district court ruled in favor of the plaintiffs, effectively allowing states to adopt California's more stringent standards were EPA to grant the requisite waiver.¹⁴³ In so doing, the court rejected arguments raised by automakers that the GHG emission limits were too costly, technically impossible to achieve, amounted to fuel economy standards, would limit consumer choice and have a negative impact on the automobile industry. The district court, framing the issue in terms of a potential statutory conflict between the Clean Air Act and EPCA, determined that Congress was aware of a potential conflict between tighter air pollution control standards and improved fuel economy when it amended the Clean Air Act in 1977 and allowed California to adopt stricter emission regulation, thus indicating that the regulations were sufficiently distinct from fuel economy standards and therefore not preempted by EPCA.¹⁴⁴ In addition, the court, referencing *Massachusetts v. EPA*, noted that potential overlap between the two statutes is not fatal.¹⁴⁵ The court also rejected plaintiffs' claims that the California GHG standard was technically infeasible, economically unreasonable, and would constrain consumer choice.¹⁴⁶ Finally, the court rejected plaintiffs' foreign policy preemption claims that Vermont's GHG standard conflicts with the United States' attempt to negotiate multilateral agreements to reduce international GHG emissions.¹⁴⁷ The auto manufacturers appealed the ruling on October 5, 2007.

[ii] NEPA

Several cases have been brought concerning whether the National Environmental Policy Act (NEPA) required particular actions to take into account climate change. The first such case, *City of Los Angeles v. National Highway Traffic Safety Administration*, concerned the setting of the Corporate Average Fuel Economy (CAFE) standard. The complaint alleged that a lower standard would worsen global warming. The court found that the plaintiffs had standing to bring the lawsuit, but that the one-mile per gallon change in the CAFE standard at issue was not so significant as to require an environmental impact statement (EIS).¹⁴⁸ A 2003 case, *Border Power Plant Working Group v. Department of Energy*, concerned the construction of transmission lines to carry electricity from new power plants in Mexico to users in southern California. The court found that CO₂ emissions should have been analyzed under NEPA.¹⁴⁹ That same year, in *Mid States Coalition for Progress v. Surface Transportation Board*, the Eighth Circuit considered the

¹⁴³ *Green Mountain Chrysler v. Crombie*, 508 F. Supp.2d 295 (D. Vt. 2007).

¹⁴⁴ *Id.* at 354.

¹⁴⁵ *Id.* at 355-56.

¹⁴⁶ *Id.* at 365-92.

¹⁴⁷ *Id.* at 392-97.

¹⁴⁸ *City of Los Angeles v. National Highway Traffic Safety Administration*, 912 F.2d 478 (D.C. Cir. 1990).

¹⁴⁹ *Border Power Plant Working Group v. Department of Energy*, 260 F. Supp.2d 997 (S.D. Cal. 2003).

construction of a rail line to bring coal from mines in Wyoming to power plants in Minnesota and South Dakota. The court found that the EIS should have considered the air emissions (including CO₂) from the power plants.¹⁵⁰ In response, the agency went back and supplemented the EIS by including a cursory discussion of climate change impacts. When the new document was challenged, the court found it to be sufficient.¹⁵¹

In *Friends of the Earth, Inc. v. Mosbacher*, plaintiffs alleged that the actions of the Overseas Private Investment Corporation (OPIC) and the Export-Import Bank (Ex-Im Bank) in financing several energy projects abroad would affect the climate in the U.S. by generating GHGs and that OPIC and Ex-Im Bank should have analyzed these impacts under NEPA. The District Court for the Northern District of California held that the case should go forward, finding that because domestic effects were alleged and the relevant decisions were made in the U.S., the case did not fail for alleging only extraterritorial impacts. It found disputed issues of fact as to whether the federal actions in financing the projects were so significant that EISs should have been prepared.¹⁵² The case was settled in February 2009. Under the terms of the settlement, the Ex-Im Bank, which provides financing for exports from the U.S., and OPIC, which offers insurance and loan guarantees for projects in developing countries, will revise their policies regarding the environment in consultation with representatives of the plaintiffs. Additionally, the bank will be required, whenever possible, to post environmental documents online for public comment and will, in conjunction with representatives of the plaintiffs, “develop and implement a carbon policy.” Further, the settlement requires the bank to assume a “leadership role” by taking actions such as encouraging transparency with regard to GHG emissions and “proposing common greenhouse gas mitigation standards for financed projects.” The settlement with OPIC requires that any project that emits more than 100,000 tons of CO₂ equivalent a year be subject to an environmental impact assessment that takes into account GHG emissions. In addition, the settlement requires OPIC to report the emissions from such projects to the public on a yearly basis and to reduce the number of projects by 20% over the next 10 years.¹⁵³ In March 2010, as part of the settlement, the Ex-Im Bank finalized a climate change policy that includes a loan guarantee program for renewable energy projects, a due diligence process for highly carbon-intensive projects which include a requirement that projects that generate between 700-850 pounds of CO₂ per megawatt adopt “best appropriate technology” for greenhouse gases, and a mechanism for tracking and reporting greenhouse gas emissions resulting from projects financed by the Bank.

In an important decision in November 2007, the Ninth Circuit held that the National Highway Traffic Safety Administration (NHTSA) violated NEPA when issuing its Corporate Average Fuel Economy (CAFE) Standards for light trucks and SUVs for the 2008-11 model years because its environmental assessment failed to examine the rule’s cumulative impact on

¹⁵⁰ *Mid States Coalition for Progress v. Surface Transportation Board*, 345 F.3d 520 (8th Cir. 2003).

¹⁵¹ *Mayo Foundation v. Surface Transportation Board*, 472 F.3d 545 (8th Cir. 2006).

¹⁵² *Friends of the Earth, Inc. v. Mosbacher*, 488 F.Supp.2d 889 (N.D. Cal. March 20, 2007).

¹⁵³ A copy of the settlement is available at <http://www.climatecasechart.com>.

greenhouse gas emissions and because the agency failed to analyze a reasonable range of alternatives.¹⁵⁴ The plaintiffs, several environmental groups and states, alleged that NHTSA failed to consider greenhouse gas emissions in its fuel-economy rulemaking and that NEPA required that the agency consider additional alternatives. The court agreed and remanded the case to NHTSA with instructions that the agency prepare an EIS assessing CO₂ emissions attributable to the new standards, as well as the actual environmental effects associated with climate change.

[iii] Coal-Fired Power Plants

There have been a number of lawsuits filed challenging the construction, permitting, or operation of coal-fired power plants on the ground that their operation would contribute to climate change.¹⁵⁵ For example, in *In re Otter Tail Power Co.*,¹⁵⁶ the Supreme Court of South Dakota upheld the state's approval of a permit to construct a coal-fired energy conversion facility. Several non-profit organizations asserted that the GHG emissions from the plant would contribute to climate change, thereby posing a threat of serious environmental injury. The South Dakota Public Utilities Commission disagreed, concluding that although the plant would emit CO₂, the amount would not pose a serious threat to the environment. The court upheld the Commission's ruling, holding that it was well-reasoned and therefore was not clearly erroneous. Several cases challenging permits under the Clean Air Act's "best available control technology" (BACT) have also been unsuccessful.¹⁵⁷

However, in July 2007, the Florida Public Service Commission denied a petition from the Florida Power & Light to build two new coal-fired power plants.¹⁵⁸ In its decision, the Commission cited the uncertainty regarding emerging energy policy decisions at the state and federal level concerning the price of coal as one basis for its denial. In addition, in October 2007, the Kansas Department of Health and Environment denied a permit for a new coal-fired power plant, stating that the plant's proposed CO₂ emissions posed a substantial endangerment to

¹⁵⁴ Center for Biological Diversity v. National Highway Traffic Safety Administration, 2007 U.S. App. LEXIS 26555 (9th Cir. Nov. 15, 2007).

¹⁵⁵ See "Climate Change Litigation in the U.S.," prepared by Michael B. Gerrard & J. Cullen Howe of Arnold & Porter LLP, available at <http://www.climatecasechart.com>. Persons wishing to be added to the list to receive e-mails with updates to the chart should send a request to cullen.howe@aporter.com.

¹⁵⁶ 2008 S.D. LEXIS 5 (South Dakota Jan. 16, 2008).

¹⁵⁷ *Sierra Club v. EPA*, 499 F.3d 653 (7th Cir. 2007) (denying permit challenge to proposed power plant on grounds that EPA had to determine whether hauling low sulfur coal from long distance would be best available means for controlling air pollution); *In re Christian Co. Generation, LLC*, PSD Appeal No. 07-01 (EPA App. Bd. Jan. 2008) (dismissing appeal because Sierra Club did not raise BACT issue during public comment period for draft permit).

¹⁵⁸ *In re Florida Power & Light*, Docket No. 070098-EI, Order No. PSC-07-0557—FOF-EI (Fla. Pub. Serv. Comm. July 2, 2007).

the health of persons or the environment.¹⁵⁹ In March 2008, the Kansas state legislature passed legislation in an effort to reverse this denial, but this bill was vetoed by the governor. In June 2008, a Georgia state court held that the Georgia Environmental Protection Division must limit the amount of CO₂ emissions from a proposed coal-fired electric generation plant before construction can move forward.¹⁶⁰

In November 2008 EPA's Environmental Appeals Board (EAB) found that EPA should have considered BACT for CO₂ in approving a proposed coal-fired plant in Utah.¹⁶¹ Previously, EPA granted a PSD permit on August 2007, authorizing the construction of a waste-coal-fired electric generating unit near Bonanza, Utah. On appeal to the EAB, the Sierra Club argued that because the Supreme Court found in *Massachusetts v. EPA* that CO₂ is an air pollutant under the Clean Air Act and because EPA regulated CO₂ by imposing monitoring and reporting requirements, a PSD permit for the facility must require BACT for CO₂ emissions. EPA disagreed, arguing that the Clean Air Act phrase requiring BACT was ambiguous, and that it had historically interpreted the BACT to describe pollutants that are presently subject to a statutory or regulatory provision that requires actual control of emissions, which was not the case with CO₂. The EAB remanded the case to the Region to reconsider a BACT limit for CO₂. The EAB suggested that EPA might be best served through "an action of nationwide scope, rather than through this specific permitting proceeding."

Five days later, then-EPA Administrator Stephen L. Johnson issued a memorandum to EPA's Regional Administrators taking the opposite position of EAB.¹⁶² Mr. Johnson stated that, as of the date of the memo, EPA would interpret the definition of "regulated NSR pollutant" to exclude pollutants for which EPA regulations only require monitoring or reporting, which included CO₂. In February 2009, EPA Administrator Lisa Jackson issued a letter stating that EPA will reconsider the memorandum.¹⁶³ While Administrator Jackson opted against a complete stay of the memorandum, in the letter she announced her intention to open a public comment period regarding the PSD issue.

[2] Common Law Claims

The second category is common law claims. Several lawsuits have been brought or are pending claiming that GHG emissions are a public nuisance or otherwise actionable at common law. In *Connecticut v. American Electric Power Co.*, eight states and the City of New York sued

¹⁵⁹ Decision of Roderick L. Brembry, Commissioner, Kansas Dept. of Health and Environment (Oct. 18, 2007).

¹⁶⁰ *Friends of the Chattahoochee, Inc. v. Ga. Dept. of Nat. Resources*, Index No. 2008CV146398 (Fulton Co. Sup. Ct. June 30, 2008). A copy of this decision is available at <http://www.climatecasechart.com>.

¹⁶¹ *In re Deseret Power Electric Cooperative*, PSD appeal No. 07-03 (EAB, Nov. 13, 2008).

¹⁶² Available at http://www.epa.gov/nsr/documents/psd_interpretive_memo_12.18.08.pdf.

¹⁶³ The letter is available at http://pub.bna.com/ptcj/JacksonLetter_Memo_Reconsideration.pdf.

the five biggest power companies in the United States claiming their emissions were a nuisance by contributing to climate change.¹⁶⁴ The District Court for the Southern District of New York dismissed their suit, finding it raised a political question that could not be answered by the courts.¹⁶⁵ The court noted that Congress had recognized that CO₂ emissions caused global warming and that global warming would have severe adverse impacts.¹⁶⁶ However, as Congress had refused to impose limits on CO₂ emissions, as sought by the plaintiffs, the court found it was without authority to resolve the political question. In September 2009, the Second Circuit reversed the district court, holding that while the plaintiffs' claims had political implications, they remained justiciable in the federal courts and that the states, the City and the land trusts all had standing to pursue those claims.¹⁶⁷ The Court acknowledged the political implications of any decision involving possible limits on CO₂ emissions are important in the context of climate change, but held that not every case with political overtones is non-justiciable and that it was error to equate a political question with a political case. While acknowledging that the EPA or Congress could still issue regulations or adopt legislation that pre-empted the field, neither had done so and the Court therefore found that the plaintiffs' claims were not displaced by other federal laws or regulations. In December 2010, the Supreme Court granted certiorari. Justice Sotomayor recused herself; she had been on the Second Circuit panel that heard the argument below, though she had been promoted to the Supreme Court before the Second Circuit issued its ruling allowing the case to proceed.

In *California v. General Motors Corp.*, the California Attorney General filed suit against the "Big Six" auto manufacturers, alleging that under federal and state common law these automakers created a public nuisance by producing millions of vehicles that collectively emit massive quantities of CO₂. The suit asked the court to hold the auto manufacturers liable for damages, including future harm, caused by their ongoing, substantial contribution to the public nuisance of global warming. Supplemental briefings were submitted after the decision in *Massachusetts v. EPA*. In September 2007, the District Court for the Northern District of California dismissed the suit. Citing to the decision in *Connecticut v. American Electric Power Co.*, the district court held that the case raised nonjusticiable political questions.¹⁶⁸ An appeal was filed, but later withdrawn.

In *Comer v. Nationwide Mutual Ins. Co.*,¹⁶⁹ fourteen property owners who claimed they had suffered losses as a result of Hurricane Katrina sought class-certification in a lawsuit against

¹⁶⁴ The states were California, Connecticut, Iowa, New Jersey, New York, Rhode Island, Vermont and Wisconsin.

¹⁶⁵ *Connecticut v. American Electric Power Co.*, 2005 U.S. Dist. LEXIS 19964 (S.D.N.Y. Sept. 22, 2005).

¹⁶⁶ *Id.* at *10-11.

¹⁶⁷ *Connecticut v. American Electric Power Co.*, 2009 U.S. App. LEXIS 20873 (2d Cir. Sept. 21, 2009).

¹⁶⁸ *California v. General Motors Corp.*, 2007 U.S. Dist. LEXIS 68547 (N.D. Cal. Sept. 17, 2007).

¹⁶⁹ 2006 U.S. Dist. LEXIS 33123 (S.D. Miss. Feb. 23, 2006).

numerous insurance companies that issued policies insuring affected properties, mortgage lenders that allegedly failed to maintain adequate insurance coverage on these properties, and chemical manufacturers and oil companies that allegedly caused damage to affected properties by contributing to climate change. The court refused to certify the insurance company and mortgage lender classes based on the difficulty and impracticality to resolving “individual questions of damage, coverage, policy provisions, mortgage obligations, and other relevant particulars” through the class action framework.¹⁷⁰ The court also declined to determine whether a class action is the appropriate vehicle for resolving plaintiffs’ claims against the chemical manufacturer and oil company defendants, although it did address the seemingly insurmountable difficulties of basing a class action, or any lawsuit, on damages resulting from a defendant’s contribution to climate change, concluding that although plaintiffs were free to pursue their lawsuit, the court foresaw “daunting evidentiary problems” in proving their allegations by a preponderance of the evidence.¹⁷¹ In August 2007, the district court dismissed the suit, finding that the issues raised were more appropriate for the legislative and executive branches.¹⁷²

In October 2009, the Fifth Circuit reversed, finding that the plaintiffs had standing to assert their nuisance, trespass, and negligence claims.¹⁷³ The Circuit held that for purposes of Article III standing, an indirect causal relationship will suffice so long as there is a fairly traceable connection between the alleged injury and the conduct of the defendant and that the traceability need not be as close as the proximate causation needed to succeed on the merits of a tort claim. The Circuit further held that the plaintiffs’ claims did not present nonjusticiable political questions because they did not present any specific question that is exclusively committed by law to the discretion of the legislative or executive branch. However, the Circuit did uphold the dismissal of the plaintiffs’ claims for unjust enrichment, fraudulent misrepresentation, and civil conspiracy claims, finding that the plaintiffs lacked standing on these claims given that they essentially alleged a massive fraud on the political system resulting from the failure of environmental regulators to impose proper costs on the defendants, and that this type of generalized grievance was best left to the legislative and executive branches.

In February 2010, the Fifth Circuit granted *en banc* review and vacated the 2009 decision.¹⁷⁴ In a subsequent decision in May 2010, the Fifth Circuit held that it could not give the lawsuit *en banc* review because it no longer had a quorum to do so, but it left standing the order vacating the panel decision.¹⁷⁵ The action means that the district court’s dismissal of the lawsuit stands. The court said plaintiffs may now seek review from the U.S. Supreme Court. Three judges vigorously dissented. The plaintiffs have filed a motion with the Supreme Court

¹⁷⁰ *Id.* at *3.

¹⁷¹ *Id.* at *4.

¹⁷² *Id.*

¹⁷³ *Comer v. Murphy Oil USA*, 2009 U.S. App. LEXIS 22774 (5th Cir. Oct. 16, 2009).

¹⁷⁴ *Comer v. Murphy Oil USA*, 598 F.3d 208 (5th Cir. 2010).

¹⁷⁵ *Comer v. Murphy Oil USA*, 607 F.3d 1049 (5th Cir. 2010).

asking it to issue a mandamus directing the Fifth Circuit to review and decide the case; as this is written, the Supreme Court has not ruled on this motion.

In *Native Village of Kivalina v. ExxonMobil Corp.*,¹⁷⁶ a case filed in February 2008, the village of Kivalina, Alaska, alleged that GHG emissions from defendant oil, electric utility and coal companies constitute a nuisance under both federal and state law and seeks to recover damages up to \$400 million for the costs of relocating the entire village. The village, which has an elevation of 10 feet above sea level, claims it is significantly threatened by flooding from storm surges. Kivalina also alleged that certain of the defendants conspired to create a misinformation campaign designed to deceive the public about the science of climate change and that this conspiracy contributed to the village's injuries.

In September 2009, a federal district court in California dismissed the case, finding that it lacked jurisdiction under the political question doctrine. The court held that resolving the claim would require it to make policy determinations relating to the use of fossil fuels and other energy sources and to consider their value in relation to the environmental, economic, and social consequences of such use. In addition, the court found that the village lacked standing because it was unable to trace its alleged injuries to any particular company and that its claims for damages was dependent on a series of events far removed from the defendants' alleged discharged of GHGs.¹⁷⁷ An appeal of this decision is pending in the Ninth Circuit.

In *Steadfast Insurance Co. v. The AES Corporation*,¹⁷⁸ a case filed in Virginia state court in July 2008, an insurance company seeks a declaratory judgment that it is not liable for any damages that AES Corporation, a defendant in *Native Village of Kivalina v. ExxonMobil Corp.*, is obligated to pay in that lawsuit. The company issued a series of general liability insurance policies to AES. The complaint alleges several bases for non-coverage, including that the policies only apply to claims arising from an "accident" which is not alleged by the *Kivalina* plaintiffs, that the damages occurred prior to September 2003 when the policies were issued, and because GHGs are considered a pollutant which is subject to the pollution exclusion clauses in the policies. In February 2010, a state court denied the defendant's motion for summary judgment without comment.

[3] Public International Law Claims

The third category is public international law claims. Petitions have been filed with several international commissions concerning the adverse effects of climate change on indigenous peoples or protected places. In December 2005, the Chairperson of the Inuit Circumpolar Conference, on behalf of herself and all affected Inuit regions in the United States and Canada, filed a petition against the United States with the Inter-American Commission on

¹⁷⁶ CV 08-1138 (N.D. Cal., filed Feb. 26, 2008).

¹⁷⁷ *Native Village of Kivalina v. ExxonMobil Corp.*, 2009 U.S. Dist. LEXIS 99563 (N.D. Cal. Sept. 30, 2009).

¹⁷⁸ Case No. 2008/858 (Arlington Co. Cir. Ct., filed July 9, 2008).

Human Rights, the investigative arm of the Organization of American States.¹⁷⁹ The petition alleged that the U.S., by its failure to regulate GHGs, violated Inuits' human rights by degrading the Arctic. Because the U.S. has not accepted the jurisdiction of the tribunal, the petition sought to have the Commission prepare a report declaring the responsibilities of the U.S. and recommending corrective measures.

In addition, five petitions have been made to the Intergovernmental Committee for the Protection of the Cultural and Natural Heritage of Outstanding Universal Value (the World Heritage Committee).¹⁸⁰ The petitions request that various designated World Heritage Sites be placed on the List of World Heritage in Danger because of the effects of climate change. The sites covered by the petitions are Waterton-Glacier International Peace Park (U.S./Canada), Sagarmatha National Park (Nepal), Belize Barrier Reef Reserve System (Belize), Huarascan National Park (Peru) and the Great Barrier Reef (Australia). In response, the Committee in July 2006 adopted a set of recommendations on ways to respond to the threat of climate change to many World Heritage sites.¹⁸¹

Regional, State and Local Efforts

The hostility of the U.S. government toward the Kyoto Protocol, starting with the Byrd-Hagel Resolution of 1997 and culminating with President Bush's action in 2001, created a chaotic situation. States and cities, individually and collectively, have rushed into this vacuum. This has resulted in a crazy quilt of regulation around the country.

[1] Regional Efforts

Some of these efforts to fill the federal vacuum are regional. A number of multi-state organizations and initiatives have been formed to address climate change issues. The most advanced of these is the northeastern states' Regional Greenhouse Gas Initiative (RGGI). RGGI is the first mandatory CO₂ mitigation trading system in the United States. Its members include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. Collectively the member states are such large emitters that they would count as the sixth largest country in the world by volume of GHG emissions in 2000. RGGI aims initially to regulate CO₂ emissions from electric power plants that have a capacity of at least 25 MW, though other sources and gases may be targeted in the future. Mandatory emission reduction targets will take effect on January 1, 2009. RGGI aims to stabilize current levels of CO₂ emissions by 2015, with a 10% reduction from current levels by 2019. Meeting these targets will be aided by a cap-and-trade system and will be governed by a complex set of

¹⁷⁹ The petition is summarized at http://earthjustice.org/news/documents/12-05/Petition_Summary.pdf.

¹⁸⁰ Convention Concerning the Protection of the World Cultural and Natural Heritage, art. 8, signed Nov. 23, 1972, entered into force Dec. 17, 1975, 27 U.S.T. 37.

¹⁸¹ These recommendations are available at <http://whc.unesco.org/en/news/262>.

rules that in some ways resemble those of the European Union's Emissions Trading System. Twenty-five percent of the allocations will be for consumer benefit while the remaining 75% will be left to each state to allocate as it sees fit.

RGGI held its first regional auction of CO₂ emissions allowances on September 10, 2008, with approximately 12.5 mmt of allowances selling at a clearing price of \$3.07 per ton. New York, New Jersey, New Hampshire, and Vermont did not participate in the first auction due to incomplete state-level regulations. The second auction was held on December 17, 2008 and all ten member states participated. The clearing price was \$3.38. All 31.5 million tons of CO₂ allowances offered for sale were sold, yielding approximately \$106.5 million in proceeds. The third auction was held on March 18, 2009. 31.5 million CO₂ allowances available for immediate use sold for a clearing price of \$3.51 and another 2.17 million allowances were sold at a clearing price of \$3.05, but cannot be used until 2012. The auction raised a total of \$117 million in proceeds. Subsequent auctions have resulted in lower clearing prices. In September 2009, the clearing prices for allowances dropped to \$2.19. In December 2009, the price dropped to \$2.05 per allowance. In June 2010, the price dropped to \$1.88 per allowance, close to the \$1.86 price floor established under the cap-and-trade scheme. In August 2010, RGGI released a report finding that emissions allowances decreased considerably in price over the first year of the program, with trading largely restricted to utilities subject to the regional cap on carbon dioxide emissions.¹⁸² In September 2010, the price dropped to the floor price of \$1.86 per allowance. For the first time, all of the RGGI allowances available for current use did not sell at auction. That same month, a report prepared by RGGI's market monitor, Potomac Economics, found that the volume of futures trading for RGGI allowances in the first quarter of 2010 dropped by 83 percent from the fourth quarter of 2009, a decline attributed to the recession, falling natural gas prices, and the subsequent decline in demand for electricity.¹⁸³

In 2007, a group of 31 states announced plans to develop a national registry to measure and track greenhouse gas emissions. The Climate Registry aims to standardize best practices in greenhouse gas emissions data reporting and will establish a set of common reporting protocols that groups can use to track emissions and coordinate policy.¹⁸⁴

In November 2007, nine states (Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Ohio, South Dakota and Wisconsin) and the Province of Manitoba signed the Midwestern Greenhouse Gas Accord, pledging to establish a mechanism that resembles RGGI.¹⁸⁵ In June 2009, the Accord announced a plan whereby member states would aim to reduce GHG emissions

¹⁸² This report is available at http://www.rggi.org/docs/MM_2009_Annual_Report.pdf.

¹⁸³ This report is available at http://www.rggi.org/docs/MM_Secondary_Market_Report_2010_Q1.pdf.

¹⁸⁴ Information on the Climate Registry is available at <http://www.theclimateregistry.org/index.html>.

¹⁸⁵ Information about the Accord is available at <http://www.midwesterngovernors.org/govenergynov.htm>.

20 percent from 2005 levels by 2020 and 80 percent by 2050.¹⁸⁶ However, there has been little progress on the plan since it was introduced.

The Western Climate Initiative has also formed, consisting of the states of Arizona, California, Montana, New Mexico, Oregon, Utah and Washington, and the provinces of British Columbia, Manitoba, Ontario, and Quebec. While RGGI only covers CO₂ emitted from power generating stations over 25 MW in size, early indications are that both the Midwestern and Western programs will be broader in their scope and coverage. In July 2010, the Western Climate Initiative released a document that outlines its design for a regional cap-and-trade program.¹⁸⁷ Its strategy is to cut GHG emissions to 15 percent below 2005 levels by 2020. California, New Mexico, Quebec, Ontario, and British Columbia are on track to have trading systems operational by 2012. In October 2010, California enacted draft rules establishing a state-wide cap-and-trade program, which is explained in more detail below.¹⁸⁸ These rules were finalized in December 2010. In November 2010, the New Mexico Environmental Improvement Board approved by a 4-3 vote a greenhouse gas cap-and-trade program that will allow the state to participate in the WCI. The program is expected to affect about 63 large industrial sources in the state, including electricity generators and the largest emission sources in the oil and gas sector. Under the rules, each covered source must reduce its emissions by 2 percent per year from 2010 levels until 2020 or acquire equivalent emissions credits from other participants.¹⁸⁹

In July 2008, the Bay Area Air Quality Management District became the first agency in the nation to impose fees on businesses that emit GHGs. The new regulation requires businesses in and around San Francisco to pay 4.4 cents for every metric ton of CO₂ they emit. In June 2010, the District adopted air quality thresholds under the California Environmental Quality Act that, among other things, include new thresholds of significance for GHGs for land use development projects, stationary source projects, and land use plans.¹⁹⁰

In November 2008, at the Governors' Global Climate Summit, 13 states and regions of five foreign countries signed a pact agreeing to work together to battle climate change. Under the agreement, the governors of these states along with regional leaders from Mexico, Canada, Brazil, India and Indonesia pledged to take steps to curb GHGs in sectors with a high potential for environmental and economic benefits, including forestry, agriculture, cement, iron and steel,

¹⁸⁶ The details of the plan are available at http://www.midwesternaccord.org/Accord_Draft_Final.pdf.

¹⁸⁷ The document, entitled "The Design for the Western Climate Initiative Regional Program," is available at <http://westernclimateinitiative.org/the-wci-cap-and-trade-program/program-design>.

¹⁸⁸ *See infra*.

¹⁸⁹ Additional information about New Mexico's program is available at <http://www.nmev.state.nm.us/cc>.

¹⁹⁰ These thresholds are available at http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/Board%20Resolution%20Adopting%20CEQA%20Thresholds_6_2_10.ashx.

aluminum, energy and transportation. However, the agreement is nonbinding and does not commit the leaders to any specific measures.

In December 2009, the governors of eleven northeastern states--which includes the ten states that are part of the Regional Greenhouse Gas Initiative plus Pennsylvania--signed a Memorandum of Understanding committing their states to further reduce greenhouse gas emissions from fuels, including transportation fuels, and, potentially, fuel oil used for heating.¹⁹¹ The states committed to assess the feasibility of a range of reduction goals by early 2011, including a ten percent cut in fuel carbon intensity and development of a framework for a regional low-carbon fuel standard to ensure sustainable use of renewable fuels. The framework will also determine the best methods for creating and trading emission credits for the sale of low-carbon fuel. The group intends ultimately to develop a model rule for enforcing the standard, which individual states may adopt through administrative or legislative means. In June 2010, the states signed another agreement to collaborate on developing policies and programs to reduce GHG emissions through transportation improvements and efficiencies.¹⁹²

[2] State Efforts

Even more activity is occurring at the state level. In 1990, Connecticut enacted the first state climate change law to require specific actions for reducing CO₂.¹⁹³ In 1997, Oregon enacted the first state law limiting emissions of CO₂ by new energy utilities.¹⁹⁴ In 2000, New Jersey added provisions to its emissions trading rule for the generation and banking of greenhouse gas credits.¹⁹⁵

In 2002, California enacted legislation that made it the first state to regulate GHG emissions from passenger vehicles, including cars, sport utility vehicles, mini-vans, and pickup trucks.¹⁹⁶ In September 2006, California passed AB 32 (the bill's number), otherwise known as the Global Warming Solutions Act.¹⁹⁷ The law became effective on January 1, 2007. AB 32 creates the first enforceable state-wide program in the U.S. to cap all GHG emissions from major industries. It requires that CO₂ emissions be cut to 1990 levels by 2020, including the CO₂ emitted by out-of-state electricity generation for transmission into the state. The California Air

¹⁹¹ The Memorandum of Understanding is available at <http://www.nescaum.org/topics/low-carbon-fuels>.

¹⁹² The document, entitled "The Transportation and Climate Initiative Declaration of Intent," is available at <http://www.georgetownclimate.org/state/files/TCI-declaration.pdf>.

¹⁹³ 1990 Conn. Acts 219 (H.B. 5696).

¹⁹⁴ H.B. 3283 (signed June 26, 1997).

¹⁹⁵ N.J. Admin. Code §§ 7:27-30.2 and 7:27-30.5.

¹⁹⁶ A.B. 1493 (Cal. signed July 22, 2002).

¹⁹⁷ A copy of the bill and its legislative history are available at http://www.leginfo.ca.gov/cgi-bin/postquery?bill_number=ab_32&sess=PREV&house=B&author=nunez.

Resources Board (CARB) is the state agency responsible for monitoring and regulating GHG emission sources under AB 32, and the details of the bill will be developed through CARB's rule-making process. Detailed regulations are due to be adopted by CARB on January 1, 2011 and to be effective on January 1, 2012. CARB has been vigorously pursuing implementation of this enactment. On November 2, 2010, California voters defeated Proposition 23, which would have stayed the enactment of AB 32 until unemployment in the state fell below 5.5 percent for one year. In October 2010, CARB issued draft rules establishing a state-wide greenhouse gas cap-and-trade program beginning on January 1, 2012.¹⁹⁸ These draft rules establish a phased in compliance framework designed to reduce the state's emissions to approximately 15% below 2012 levels by 2020. CARB anticipates that the program will cover 85% of the state's greenhouse gas emissions. CARB's rules will apply to businesses in the state with reported or verified annual emissions exceeding 25,000 metric tons (mt) of carbon dioxide equivalents (CO₂e). During the initial 2012-15 period, the program will cover emissions from large industrial sources and electrical generating facilities. Beginning in 2012, the program will also cover emissions from "first deliverers" of electricity, which include electricity generating facilities located within California as well as entities that import electricity from out-of-state sources into California. Beginning in 2015, fuel distributors with annual emissions exceeding the threshold will be included in the program. In 2012, CARB will set the cap at the level of emissions forecast for that year for covered sources during the initial period. The cap will decline approximately 2% per year between 2012 and 2014, and approximately 3% per year beginning in 2015. Each year, CARB will distribute emission allowances equal to the declining cap. During the first few years of the program, CARB has proposed allocating most of the allowances for free. CARB's proposed rules establish a limited offset program--covered entities will be able to meet up to 8% of their compliance obligation via offset credits and will initially permit offsets from four types of programs: forestry, urban forestry, livestock (*i.e.* methane), and removing existing stock of ozone-depleting substances. These rules were finalized in December 2010.¹⁹⁹

In September 2008, California enacted SB 375, a law that utilizes a streamlined environmental review process to incentivize land developers to incorporate GHG reduction strategies into new residential and mixed-use developments.²⁰⁰ The law directs CARB to establish GHG reduction targets for emissions from automobiles and light trucks. In addition, each of California's 18 metropolitan planning organizations must devise a "sustainable community strategy" and incorporate it into their regional transportation plans in order to meet the targets set by CARB. The law also provides relaxed requirements under the California Environmental Quality Act (CEQA). "Transit priority projects" are those have a 50% residential use with a density of at least 20 units per acre, are located within a half mile of a major transit

¹⁹⁸ The draft rules are available at <http://www.arb.ca.gov/regact/2010/capandtrade10/capandtrade10.htm>.

¹⁹⁹ Additional information about the cap-and-trade program is available at <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>.

²⁰⁰ L. 2008, ch. 728. A copy of the law is available at http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351_0400/sb_375_bill_20080930_chaptered.html.

stop or a high quality transit corridor and are deemed “sustainable communities projects” are exempt from CEQA review. In addition, residential or mixed-use residential projects that are consistent with the sustainable community strategy, incorporate mitigation measures required by an applicable prior environmental review document, and dedicate 75% of the total square footage to residential uses qualify for streamlined CEQA review.

Several lawsuits have been filed in California alleging that environmental impact reports issued under the state’s impact assessment law, CEQA should consider climate change. In addition, the California Attorney General has submitted to twelve local governments formal comments seeking analysis of climate change in CEQA documents. In April 2007, the Attorney General brought a lawsuit against the County of San Bernardino.²⁰¹ The lawsuit was settled in August 2007 under terms that require the county to develop an inventory of GHG emissions related to land-use decisions and county operations, set emissions reduction goals, and adopt mitigation measures. At the end of a 30-month period, the county will amend its general plan, which governs growth in the county.²⁰²

Massachusetts has required that climate change impacts be considered in its equivalent to NEPA. On April 23, 2007, the Massachusetts Executive Office of Energy and Environmental Affairs issued its “Greenhouse Gas Emissions Policy.” It applies to many projects undergoing analysis under the Massachusetts Environmental Policy Act (MEPA). The policy requires quantification of project-related GHG emissions, and it states that “MEPA will also require proponents consider a project alternative in the [EIS] that incorporates measures to avoid, minimize, or mitigate such emissions. For projects subject to the policy, MEPA will immediately begin incorporating into new scoping certificates the requirement that the proponent identify and describe sources of, and propose measures to avoid, minimize, or mitigate for, project-related GHG emissions.”²⁰³

In March 2009, the New York State Department of Environmental Conservation issued proposed guidelines for the discussion of climate change issues under the New York State Environmental Quality Review Act. In July 2009, these regulations were finalized.²⁰⁴

As of December 2010, at least 21 states have passed legislation, enacted executive orders or proposed plans concerning GHG reduction targets. These states include Arizona, California, Colorado, Connecticut, Florida, Hawaii, Illinois, Massachusetts, Maine, Maryland, Minnesota, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island,

²⁰¹ State of California v. County of San Bernardino, No. CIV-5507-00329 (Cal. Super. Ct. filed Apr. 12, 2007).

²⁰² http://ag.ca.gov/cms_pdfs/press/2007-08-21_San_Bernardino_settlement_agreement.pdf.

²⁰³ A copy of the policy is available at <http://www.mass.gov/envir/mepa/pdf/misc/GHG%20Policy%20FINAL.pdf>

²⁰⁴ See New York State Dept. of Env. Conservation, *Climate Change Guidance Documents*, available at <http://www.dec.ny.gov/regulations/56552.html>.

Vermont, Virginia and Washington.²⁰⁵ Of these 21 states, eight adopted greenhouse gas emissions reduction plans in 2007. On February 13, 2007, then-Governor Rod Blagojevich of Illinois announced new statewide GHG emission reduction targets of 1990 levels by 2020 and 60% below 1990 levels by 2050. On May 3, 2007, Governor Christine Gregoire of Washington signed SB 6001, which set into law statewide GHG emission reduction goals and strategies originally announced in a February 2007 executive order. The new law commits Washington to reduce statewide emissions to 1990 levels by 2020, 25% below 1990 levels by 2035, and 50% below 1990 levels by 2050.²⁰⁶ Washington subsequently passed a law in 2008 directing sources of GHGs in the state to take further steps to reduce their emissions and for major sources of GHGs to begin reporting their emissions beginning in 2010.²⁰⁷ On May 25, 2007, Minnesota Governor Tim Pawlenty signed into law the Next Generation Energy Act, which established statewide GHG emission reduction goals of 15% by 2015, 30% by 2025, and 80% by 2050, based on 2005 levels.²⁰⁸ On June 30, 2007, Hawaii Governor Linda Lingle signed into law Act 234, the Global Warming Solutions Act of 2007, which mandates that statewide GHG emissions be reduced to 1990 levels by 2020.²⁰⁹ On July 6, 2007, then-New Jersey Governor Jon S. Corzine signed into law the Global Warming Response Act, A3301, which limits the level of statewide GHG emissions, and GHG emissions from electricity generated outside the state but consumed in the state, to 1990 levels by 2020 and to 80% below 2006 levels by 2050.²¹⁰ These targets were previously set in Executive Order 54 which the Governor signed in February 2007. On July 13, 2007, Florida Governor Charlie Crist issued Executive Order 07-127, which established statewide GHG emission reduction targets of 2000 levels by 2017, 1990 levels by 2025, and 80% below 1990 levels by 2050.²¹¹ On August 6, 2007, Oregon Governor Ted

²⁰⁵ A 50-state survey of state responses to climate change, prepared by the Pace Law School Center for Environmental Legal Studies, can be found at http://www.abanet.org/abapubs/globalclimate/docs/stateupdate_102908.pdf. Another survey can be found at http://www.pewclimate.org/what_s_being_done/in_the_states/emissionstargets_map.cfm.

²⁰⁶ A copy of this law is available at <http://www.leg.wa.gov/pub/billinfo/2007-08/Pdf/Bills/Senate%20Passed%20Legislature/6001-S.PL.pdf>.

²⁰⁷ H.B. 2815, L. 2008, ch. 14. The text of the legislation is available at <http://apps.leg.wa.gov/documents/billdocs/2007-08/Pdf/Bills/Session%20Law%202008/2815-S2.SL.pdf>.

²⁰⁸ A copy of this law is available at <http://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=S0145.2.html&session=ls85>.

²⁰⁹ A copy of this law is available at http://www.capitol.hawaii.gov/sessioncurrent/bills/HB226_CD1_.htm.

²¹⁰ A copy of this law is available at http://www.njleg.state.nj.us/2006/Bills/A3500/3301_R2.PDF.

²¹¹ A copy of this Executive Order is available at <http://www.flgov.com/pdfs/orders/07-127-emissions.pdf>.

Kulongoski signed House Bill 3543, which set statewide GHG emission targets for the state.²¹² HB 3543 directs the state to stop the growth of GHG emissions by 2010 and to reduce emissions to 10% below 1990 levels by 2020 and to 75% below 1990 levels by 2050.

In 2008, Massachusetts enacted the Global Warming Solutions Act, which mandates GHG emission reductions of up to 25% below 1990 levels by 2020 and 80% by 2050.²¹³ In July 2009, Massachusetts released final reporting rules and baseline figures under which the state will be able to measure its progress in reducing GHG emissions.²¹⁴

In 2009, Washington enacted a law that requires companies to report emissions beginning in 2010.²¹⁵ The reporting requirements, which have not been finalized, apply to certain large mobile and stationary sources. In May 2009, Maryland enacted the Greenhouse Gas Emissions Reduction Act.²¹⁶ Among other things, the Act requires the state to achieve a 25% reduction in GHG emissions from 2006 levels by 2020 and a 90% reduction by 2050. In August 2009, Michigan Governor Jennifer Granholm signed an executive order committing the state to reduce its GHG emissions by 20% from 2005 levels by 2020 and 80% by 2050.²¹⁷ Also in August 2009, New York Governor David Paterson signed an executive order committing the state to reduce GHG emissions by 80% from 1990 levels by 2050.²¹⁸

In April 2009, the California Air Resources Board approved a regulation adopting a low-carbon fuel standard, designed to cut the average “carbon intensity” of transportation fuels by 10 percent over the next ten years.²¹⁹ The regulation establishes policy for calculating the life-cycle emissions of all vehicle fuels, specifically measuring the level of GHG emissions associated with the production, distribution and consumption of gasoline, diesel fuels and their alternatives. Fuel

²¹² A copy of this law is available at <http://www.leg.state.or.us/07reg/measures/hb3500.dir/hb3543.a.html>. In October 2008, the Oregon Environmental Quality Commission adopted a set of rules that will require businesses to begin reporting their GHG emissions in 2009. As part of the new rules, industries that hold Title V air quality permits or other polluting permits with the State Department of Environmental Quality will have to start reporting their emissions. Information on the reporting system is available at <http://www.deq.state.or.us/aq/climate/rulemaking.htm>.

²¹³ Mass. Gen. L. Ch. 21N.

²¹⁴ These rules are available at http://www.mass.gov/dep/air/climate/1990_2020_final.pdf.

²¹⁵ Wash. Admin. Code § 173-441 *et seq.*

²¹⁶ 2009 Md. Laws ch. 172 (S.B. 278).

²¹⁷ Executive Directive No. 2009-4, *available at* <http://www.michigan.gov/gov/0,1607,7-168-36898-219081--,00.html>.

²¹⁸ Executive Order No. 24, *available at* http://www.state.ny.us/governor/executive_orders/xeorders/eo_24.html.

²¹⁹ Information about California’s low-carbon fuel standard program is available at http://www.energy.ca.gov/low_carbon_fuel_standard.

providers, refiners, importers, and blenders will have to demonstrate that the mix of fuels they supply meet the declining “carbon intensity” standard each year through a market-based reporting system based on the amount of fuel sold on the state. In February 2010, a coalition of industry and business groups filed a lawsuit challenging the law, alleging that it violated the Commerce Clause.²²⁰ In July 2009, Oregon enacted a similar law.²²¹ Under the law, the Oregon Department of Environmental Quality will develop rules to cut the carbon content of car and truck fuels by 10% below 2010 levels by 2020.

In March 2010, Washington State enacted a law that aims to align the state’s greenhouse gas emissions reporting requirements with EPA’s reporting rule.²²² The Washington State Department of Ecology had developed a greenhouse gas emissions reporting system in 2009, before EPA adopted its reporting rule in September 2009. Pursuant to the new law, the state’s reporting requirements would be closer to the EPA rule. However, more facilities will be subject to the reporting requirements than under EPA’s measure. While EPA requires annual reporting for fuel suppliers and facilities that emit 25,000 metric tons of greenhouse gas emissions per year, Washington’s threshold is 10,000 metric tons. In September 2010, the Department of Ecology issued proposed rules that would require large stationary sources and transportation fuel suppliers to report their 2012 emissions beginning in 2013.²²³

In April 2010, Arizona enacted a law that forbids state agencies from regulating GHG emissions without legislative approval.²²⁴ The law effectively strips the state Department of Environmental Quality of authority that former Governor Janet Napolitano gave it via executive order in 2006.

Some states are beginning to pass legislation concerning carbon capture and sequestration (CCS), a process by which emissions are captured from large point sources, such as coal-fired power plants, and stored underground. Technology for large scale capture of CO₂ is already available and well developed. However, the long term storage of CO₂ is a relatively untried concept, and as of December 2009, no large scale power plant operates with a full carbon capture and storage system. The federal government does not currently regulate CCS, but EPA has announced that it will issue a draft rule establishing a nationwide permitting program under the Safe Drinking Water Act.²²⁵

²²⁰ National Petrochemical & Refiners Association v. Goldstein, Index No. 10-CV-163 (E.D. Cal., filed Feb. 2, 2010).

²²¹ Or. Rev. Stat. ch. 754.

²²² L. 2010, ch. 146.

²²³ These proposed rules are available at http://www.ecy.wa.gov/programs/air/globalwarm_RegHaze/GreenHouseGasreporting_rule.html.

²²⁴ L. 2010, ch. 152.

²²⁵ See “EPA to Develop Regulations for Geologic Sequestration of Carbon Dioxide,” EPA Press Release (Oct. 11, 2007), available at http://yosemite.epa.gov/opa/admpress.nsf/names/hq_2007-10-11_carbon.

In March 2008, Wyoming enacted two laws establishing a regulatory framework for CCS. HS 89 addresses property rights associated with subsurface storage space and vests ownership of the subsurface space that can be used as storage space for CO₂ with the owner of the surface lands and waters above the storage space.²²⁶ HB 90 establishes a permitting framework for CO₂ injection and storage projects and grants the state's Department of Environmental Quality permitting authority over injection and storage projects.²²⁷ In 2009, Montana enacted two laws regarding CCS. One law gives ground pore space ownership to the holder of the land's mineral rights, rather than to the surface landowner.²²⁸ The other law grants common carrier status to the industrial owners of pipelines transporting CO₂, enabling them to declare eminent domain over private property owners.²²⁹

One of the most important categories of state programs is renewable portfolio standards (RPSs), which require that a certain percentage of the electricity that utilities sell to retail customers be generated by renewable sources. There are wide variations in terms of what kinds of renewable sources qualify, and the targets, deadlines, and program designs. These programs largely arose from the deregulation of the electric utility industry (an event that also led to the creation of regional transmission organizations, which happen to facilitate regional GHG control programs). Renewable energy and conservation are also aided by public benefit funds, which derive from small fees or surcharges on electricity rates. RPSs were not adopted to control climate change, but often have climate change benefits.

Since 1991, more than 25 states have developed RPS programs.²³⁰ In November 2008, California Governor Arnold Schwarzenegger signed Executive Order 14-08, which adopted an ambitious goal of supplying 33% of the state's retail energy load from renewable sources by 2020.²³¹ In December 2008, Missouri voters approved a ballot initiative to require investor-owned utilities to generate or purchase at least 15% of their energy from renewable sources by 2021.²³² In March 2009, Virginia enacted a law that raised the renewable energy goal for the state from 12% of utilities' in-state energy sales by 2022 to 15% by 2025.²³³ In September 2009,

²²⁶ L. 2008, ch. 18; W.S. § 34-1-152. Text of this bill is available at <http://legisweb.state.wy.us/2008/Enroll/HB0089.pdf>.

²²⁷ L. 2008, ch. 25; W.S. §§ 30-5-501; 35-11-313. Text of this bill is available at <http://legisweb.state.wy.us/2008/Enroll/HB0090.pdf>.

²²⁸ Mont. L. 2009, ch. 474.

²²⁹ Mont. L. 2009, ch. 231.

²³⁰ Information about these state RPS programs is available at http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm.

²³¹ The text of E.O. 14-08 is available at http://www.cleanpower.org/reports_pdf/081117%20Gov%20EO%20S-14-08.pdf.

²³² This initiative is available at <http://www.sos.mo.gov/elections/2008petitions/2008-031.asp>.

²³³ L. 2009, ch. 744.

California Governor Schwarzenegger signed an executive order requiring that the state's RPS be raised to 33% by 2020.²³⁴ In March 2010, Colorado enacted a law that increased the state's RPS to require investor-owned utilities and certain other utilities to generate at least 30 percent of their electricity from renewable sources by 2020, replacing the previous goal of 20 percent by 2020.²³⁵ In September 2010, in response to Governor Schwarzenegger's September 2009 executive order, the California Air Resources Board unanimously adopted a Renewable Electricity Standard (RES) to require a 33% renewable energy procurement mandate by 2020 for most retail sellers of electricity in California.²³⁶

[3] Municipal Efforts

Cities are also taking action to address climate change. Municipal governments are themselves GHG generators through their sewage treatment plants; solid waste landfills; fleets of police cars, garbage trucks, fire engines, and maintenance vehicles; and school, office, and social service buildings. Many cities are reducing their own emissions, and utilizing their considerable purchasing power to specify clean appliances, vehicles, and electricity. Some are using their zoning and building code powers to influence private construction. Through the U.S. Mayors Climate Protection Agreement, some cities have agreed to reduce their emissions to Kyoto levels. The Clinton Foundation is leading other efforts by some of the world's largest cities. Over 125 U.S. cities have joined the Cities for Climate Protection Campaign and are implementing plans to reduce local emissions of greenhouse gases.²³⁷ The City of Portland, Oregon has developed its own plan to reduce greenhouse gas emissions.²³⁸ In addition, New York City has also developed a plan to reduce its greenhouse gas emissions by 30 percent by 2030.²³⁹

In June 2007, the Executive of King County, Washington (which includes Seattle) issued an Executive Order requiring county agencies to consider climate change in their review of projects under the Washington's State Environmental Policy Act (SEPA). The order requires that "climate impacts, including but not limited to those pertaining to greenhouse gases, be appropriately identified and evaluated" for every public or private project where a county department is acting as lead agency under SEPA.²⁴⁰ A similar order was proposed for city agencies in Seattle, Washington in October 2007.

²³⁴ Executive Order No. S-21-09, *available at* <http://www.gov.ca.gov/index.php?/executive-order/13269>.

²³⁵ Col. Rev. Stat. § 40-2-124.

²³⁶ Information about the RES is available at <http://www.arb.ca.gov/energy/res/res.htm>.

²³⁷ Additional information about this program is available at <http://www.iclei.org/us/ccp>.

²³⁸ City of Portland and Multnomah County, Local Action Plan on Global Warming (Apr. 2001).

²³⁹ New York City's plan, called PlaNYC, is available at http://www.nyc.gov/html/planyc2030/downloads/pdf/full_report.pdf.

²⁴⁰ Information regarding the Executive Order is available at <http://www.metrokc.gov/permits/publications/news/Sepa07Aug31.aspx>.

In September 2008, Chicago announced a plan to increase energy efficiency and reduce GHG emissions 80% by 2050 compared to 1990 levels.²⁴¹ Thirty percent of the reductions would come from investment in and implementation of energy efficiency programs for commercial, industrial and residential buildings, 34% would come from upgrading power plants and increasing renewable energy use, 23% would come from improvements in public transportation, and 13% would come from programs related to waste and industrial pollution.

In October 2009, Portland, Oregon adopted a climate action plan to reduce CO₂ emissions by 40% by 2030 and 80% by 2050, compared with 1990 levels. The plan calls for a number of initiatives to achieve this goal. For example, the city will strive to achieve zero GHG emissions in all new residential and commercial buildings, recover 90% of all solid waste generated, improve the energy efficiency of freight movement within the city, expand the urban forestry to cover one third of the city, and to establish a tax credit for businesses that install green roofs and solar panels.²⁴²

Voluntary Programs and Corporate Actions

While opposing mandatory GHG reductions, the Bush Administration encouraged voluntary programs. Federal efforts have focused on enhancing the scheme for voluntary reporting of GHG emissions; encouraging key industry sectors to reduce their emissions intensity; and encouraging individual companies to reduce their emissions through a variety of programs. A key issue is the lack of consistent standards in many voluntary programs. In 1992, under the United Nations Framework Convention on Climate Change, the U.S. and 185 other countries agreed to develop a national inventory of human-generated greenhouse gas emissions and sinks. To fulfill this obligation, EPA annually issues the Inventory of U.S. Greenhouse Gas Emissions and Sinks. The Inventory quantifies how much of each gas was emitted and describes some of the effects of these emissions on the environment. The Department of Energy's Energy Information Administration operates a program called Voluntary Reporting of Greenhouse Gases.²⁴³ The program records the results of voluntary measures to reduce, avoid, or sequester greenhouse gas emissions.

²⁴¹ The Chicago Climate Action Plan is available at <http://www.chicagoclimateaction.org>.

²⁴² Additional information about Portland's climate action plan is available at <http://www.portlandonline.com/bps/index.cfm?c=49989&a=26861>.

²⁴³ The program was authorized by section 1605(b) of the 1992 Energy Policy Act. More information on the program is available at EIA's web site at <http://www.eia.doe.gov/oiaf/1605/frntvrgg.html>. In July 2002, DOE and other federal agencies submitted recommendations to the President for enhancing the program in accordance with the Bush Administration's climate change initiative.

EPA established a voluntary program called the Climate Leaders program in 2002.²⁴⁴ The program encourages companies to develop long-term climate change strategies. Companies set corporate-wide goals for greenhouse gas reduction, inventory their emissions, and report inventory data to EPA. EPA provides technical assistance and public recognition for participating companies. In September 2010, EPA announced that it would be phasing out the program over the next year and encouraging companies to transition to similar state and other non-federal programs.

In June 2008, EPA released a guide to assist businesses in addressing the risks and opportunities associated with climate change.²⁴⁵

A growing number of major companies have taken action to assess and mitigate possible risks and have engaged in opportunities presented by climate change, including performing greenhouse gas inventories, setting GHG reduction targets, joining government and non-governmental organization programs, and issuing reports to educate stakeholders and the public about their climate change strategies.²⁴⁶ In July 2008, Wal-Mart announced that it would require supplies to answer questions about the environmental impact of their products, including greenhouse gas emissions, and that it intends to display this information on the products it sells.²⁴⁷ In February 2010, Wal-Mart announced it plans to cut greenhouse gas emissions from its supply chain by 20 million metric tons by 2015.²⁴⁸

In early 2008, three of the largest financial institutions in the world issued a new set of investment guidelines that they will use as part of their financing review to evaluate the global warming impacts of proposed energy projects. These guidelines, called “The Carbon Principles,” commit Citigroup, JP Morgan Chase and Morgan Stanley to institute a rigorous review process when contemplating investments in new coal-fired power plants. The banks will also support legislation aimed at cutting carbon dioxide emissions and promoting carbon capture and storage.²⁴⁹

²⁴⁴ More information on this program is available at <http://www.epa.gov/climateleaders>.

²⁴⁵ This guide is available at http://www.epa.gov/partners2/Biz_guide_to_epa_climate_partnerships.pdf.

²⁴⁶ More information on this program is available at http://www.epa.gov/climateleaders/docs/partnership_fact_sheet.pdf. *See also* Global Climate Change and U.S. Law, ABA Section of Environment, Energy and Resources, ch. 17 (Gerrard, M. ed. 2007).

²⁴⁷ This announcement is available at <http://walmartstores.com/FactsNews/NewsRoom/9277.aspx>.

²⁴⁸ Information about this initiative is available at <http://www.walmartstores.com/Sustainability/9660.aspx>.

²⁴⁹ “The Carbon Principles: Fossil Fuel Generation Financing Enhanced Environmental Diligence Process,” *available at* <http://www.morganstanley.com/about/press/files/carbonprinciples2.pdf>.

EPA has a number of other voluntary programs that are designed to encourage participants to reduce GHG emissions. These programs include Energy Star, WasteWise, and the Green Power Partnership. Other federal agencies, including the Department of Energy and the National Oceanic and Atmospheric Administration, also have research or voluntary programs that address climate change issues.²⁵⁰

Several nongovernmental organizations have formed partnerships with companies and trade associations, and some corporations have devoted their own GHG management strategies. The principal elements of these strategies generally include performing a corporate-wide GHG inventory; developing a management plan to ensure the accuracy of the inventory; setting and working to achieve GHG reduction targets; and communicating their activities to employees, shareholders, and the public. One prominent example of this is the GHG Protocol Initiative established by the World Resources Institute.²⁵¹

Companies see a variety of benefits in undertaking such programs. They hope to reduce their energy costs; to develop good relations with government agencies and NGOs; to enhance their public image; to become familiar with clean energy and climate mitigation technologies, and possibly to receive credit for their activities in a future regulatory scheme.

However, this country's rejection of the Kyoto Protocol puts U.S. companies at a distinct disadvantage in taking advantage of the business opportunities that are created by controlling and adapting to climate change. U.S. companies that operate in countries that have bound themselves to the Kyoto Protocol (the "Annex B" countries) clearly must meet those countries' emissions limitations, but they get no credit under Kyoto for emissions reductions they achieve in the United States. They hope they will receive credit later on, but they have no assurance they will. They find a limited U.S. market for any climate friendly products or services they develop, for there is no federal mandate to purchase such items. U.S. companies also find that the regulatory uncertainty makes it difficult for them to commit to major capital expenditures whose necessity could be affected by future climate mitigation laws. Nonetheless, in the permitting processes for several industrial facilities, especially coal-fired power plants, applicants have agreed to undertake GHG mitigation measures.

The regulatory uncertainty also creates challenges for lawyers who advise public companies on their disclosure obligations. Regulation S-K of the Securities and Exchange Commission (SEC) requires disclosure of the material effects that the costs of environmental compliance may have on capital expenditures; material legal proceedings; and the company's overall financial conditions. Many corporations are struggling with what they should say about climate-related risks, though quite a few examples of such disclosures are now available. In September 2007, New York Attorney General Andrew Cuomo issued subpoenas to several electric utilities seeking documents relating to the analysis of climate change issues in their securities disclosures; and the same month, Environmental Defense and other groups petitioned

²⁵⁰ A listing of these programs is available from EPA's web site at http://www.epa.gov/globalwarming/links/fed_links.html.

²⁵¹ See <http://www.wri.org/project/ghg-protocol>.

the SEC to issue guidance clarifying that climate change issues must be discussed in SEC filings. In 2008, Mr. Cuomo reached settlements with two of the companies, Xcel and Dynegy, under which they agreed to make certain climate disclosures as part of their securities filings.

On January 27, 2010, the SEC approved an interpretative release requiring companies to disclose several items related to climate change. The following three things related to climate change must be disclosed.²⁵² First, a company must disclose the direct effects of existing and pending environmental regulation, legislation, and international treaties on its business, its operations, risk factors and in Management's Discussion and Analysis of Financial Condition and Results of Operations (MD&A). Second, a company must disclose the indirect effects of such legislation on its business, such as changes in demand for products that create or reduce greenhouse gas emissions. Third, a company must disclose the effect on its business and operations related to the physical changes to our planet caused by climate change, such as rising seas, stronger storms, and increased drought. These changes to the environment could have a number of material effects on corporations, such as impairing the distribution and production of goods and damaging property, plant, and equipment.

In July 2010, Ceres, a coalition of investors and public interest groups, found that 95 climate-change or sustainability-related shareholder resolutions were filed thus far in 2010.²⁵³ Of these, 47 were withdrawn after successful negotiations with the companies and 16 garnered more than 30 percent of voting shares in the annual meetings.

In March 2010, ASTM International released a "Standard Guide for Financial Disclosures attributed to Climate Change."²⁵⁴ According to its language, the purpose of the guide is to provide a series of options or instructions consistent with good commercial and customary practice for climate change-related disclosures accompanying audited and unaudited financial statements.

The insurance industry is in many ways in the front lines of this uncertainty. Sea level rise, extreme weather events, and other possible consequences of climate change have the potential of leading to enormous claims by policyholders. Several large insurance companies have been actively studying climate risks, advocating regulatory actions, and selling specialized insurance products to cover these risks.

²⁵² This interpretative release is available at <http://www.sec.gov/rules/interp/2010/33-9106.pdf>.

²⁵³ A resolution tracker maintained by Ceres is available at <http://www.ceres.org/Page.aspx?pid=1260>.

²⁵⁴ ASTM E2718-10. This guide is available for purchase at <http://www.astm.org/Standards/E2718.htm>.