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Pax World, based in Portsmouth, New Hampshire, seek to invest in forward-thinking companies with sustainable business models. To identify those companies, Pax combines rigorous financial analysis with equally rigorous environmental, social and governance analysis. The result, it believes, is an increased level of scrutiny that helps it identify better-managed companies that are leaders in their industries; that meet positive standards of corporate responsibility; and that focus on the long term. Pax World avoids investing in companies that are significantly involved in the manufacture of weapons or weapons-related products, manufacture tobacco products, are involved in gambling as a main line of business, or engage in unethical business practices. Pax World's primary goal is to produce competitive returns for its investors. By integrating environmental, social and governance criteria - what it calls "sustainability" criteria - into its investment approach, the funds also seek to promote peace, protect the environment, advance equality and foster sustainable development.

Rhode Island General Treasurer, Frank T. Caprio

The General Treasurer receives and disburses all state funds, issues general obligation notes and bonds, manages the investment of state funds and oversees the retirement system for state employees, teachers and some municipal employees. He is also responsible for the management of the Unclaimed Property Division, the Crime Victim Compensation Program and the state-sponsored 529 college savings plan, the CollegeBoundfund.

Vermont State Treasurer, Jeb Spaulding

The Vermont State Treasurer's Office is responsible for the State's cash management and banking functions, investment of short-term and trust funds, bond issuance and debt management, administration of three public retirement systems and pension funds, operation of the State's unclaimed property program, and improving the financial literacy of Vermonters. In addition, the State Treasurer serves *ex-officio* on a variety of boards for quasi-public agencies and authorities, and also advises State policymakers on fiscal and economic issues.

THE SCIENCE OF CLIMATE CHANGE

The Basics of Climate Change Science

Climate change refers to a long-term rise in global average temperature. More specifically, it refers to the ongoing rise in temperature that started a century ago and is believed to be caused mainly by greenhouse gas pollution. 'Greenhouse gases' trap heat from the sun at the Earth's surface. Human activities are rapidly increasing the amount of greenhouse gases in the atmosphere, causing more heat to be trapped and increasing global temperatures. Rising temperatures have already resulted in an increase in extreme weather events, loss of sea ice and glaciers, rising sea level, and harm to wildlife. But it is not too late to avoid the most severe consequences of climate change: a sharp reduction of greenhouse gas pollution would significantly slow global warming and reduce the likelihood of dangerous and irreversible impacts.

Scientific Consensus on the Impacts of Climate Change

The recently released Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, a comprehensive review of the state-of-the-knowledge on climate change, highlights the overwhelming scientific consensus that human activities are contributing to changes in the climate system. This report reinforces the conclusions outlined in existing consensus statements by respected scientific organizations, such as the statement on climate change from 11 different national scientific academies, including the United States,¹⁴⁶ the official position statement by the American Geophysical Union,¹⁴⁷ and the official position statement by the American Meteorological Society.¹⁴⁸

¹⁴⁶ See Joint Science Academies' Statement: Global Response to Climate Change (June 2005), *available at* <http://www.royalsoc.ac.uk/displaypagedoc.asp?id=20742>.

¹⁴⁷ Position Statement, American Geophysical Union Council, Human Impacts on Climate (Dec. 2003), *available at* http://www.agu.org/sci_soc/policy/positions/climate_change.shtml.

¹⁴⁸ Information Statement, American Meteorological Soc'y, Climate Change (Feb. 1, 2007), *available at* <http://www.ametsoc.org/POLICY/2007climatechange.html>.

The IPCC's Summaries for Policymakers from each of its three working groups outline the scientific aspects of climate change, the ongoing and predicted impacts, and opportunities for mitigation and adaptation. These summaries state that:

- "Warming of the climate system is unequivocal, as is now evident from observation of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."¹⁴⁹
- "Most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic [human-produced] greenhouse gas concentrations."¹⁵⁰
- "At continental, regional, and ocean basin scales, numerous long-term changes in climate have been observed. These include changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones."¹⁵¹
- "Impacts of climate change will vary regionally but, aggregated and discounted to the present, they are *very likely* to impose net annual costs which will increase over time as global temperatures increase."¹⁵²
- "The most vulnerable industries, settlements and societies are generally those in coastal river flood plains, those whose economies are closely linked with climate-sensitive

¹⁴⁹ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Summary for Policymakers, in* CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 5 (2007), *available at* http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Print_SPM.pdf.

¹⁵⁰ *Id.* at 10. According to the Summary for Policymakers: "...the following terms have been used to indicate the assessed likelihood, using expert judgment, of an outcome or result...*Very likely* >90%, *Likely* >66%." *Id.* at 3 n.6.

¹⁵¹ *Id.* at 7.

¹⁵² INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Summary for Policymakers, in* CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY 17 (2007), *available at* <http://www.ipcc-wg2.org/index.html>.

resources, and those in areas prone to extreme weather events, especially where rapid urbanization is occurring."¹⁵³

- "Both bottom-up and top-down studies indicate that there is substantial economic potential for the mitigation of global GHG emissions over the coming decades, that could offset the projected growth of global emissions or reduce emissions below current levels."¹⁵⁴

The IPCC is "the leading body for the assessment of climate change, established by the United Nations to provide the world with a clear, balanced view of the present state of understanding of climate change."¹⁵⁵ IPCC reports are written by teams of authors nominated by governments and international organizations. Over 800 contributing authors and 450 lead authors were involved in the writing of the Fourth Assessment, and more than 2,500 scientific expert reviewers were involved in the review process. Each Summary for Policymakers is approved line by line by relevant experts and government officials.¹⁵⁶

Other resources

In addition to the attached IPCC reports, excellent and accessible summaries of the science of climate change can be found from the following resources:

- NASA's Earth Observatory website on Global Warming gives a basic overview of climate change science and findings:
<http://earthobservatory.nasa.gov/Library/GlobalWarmingUpdate/>
- The National Center for Atmospheric Research maintains a website that explains the basics of weather and climate science: <http://www.eo.ucar.edu/basics/index.html>

¹⁵³ *Id.* at 12.

¹⁵⁴ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Summary for Policymakers*, in CLIMATE CHANGE 2007: MITIGATION 9 (2007), *available at* <http://arch.rivm.nl/env/int/ipcc/>.

¹⁵⁵ Fact Sheet, Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/press/factsheet.htm>.

¹⁵⁶ *Id.*

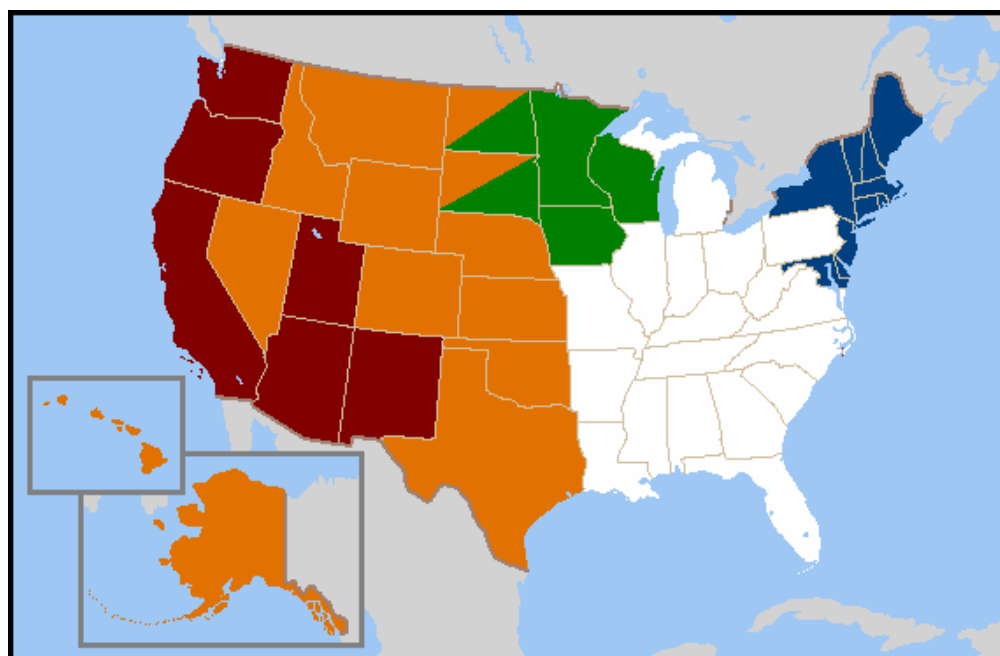
Appendix B

- The IPCC has published a pdf of Frequently Asked Questions that cover a number of climate science topics: http://ipcc-wg1.ucar.edu/wg1/Report/AR4WG1_Pub_FAQs.pdf
- Spencer R. Weart's *Discovery of Global Warming* materials, published by the American Institute of Physics, give a thorough history of climate change research and science: <http://www.aip.org/history/climate/>

REGIONAL AND STATE REGULATORY ACTIONS CONCERNING GREENHOUSE GAS EMISSIONS

This appendix illustrates the extensive geographic and programmatic diversity of state actions to reduce greenhouse gas emissions and the considerable reach of regulatory actions that currently affect business and investment decisions. It is by no means an exhaustive list of state-level climate change policies or programs.

Regional Initiatives



- Regional Greenhouse Gas Initiative [$\approx$ 18.9% U.S. GDP; 16.4% U.S. population]
- Western Climate Initiative [$\approx$ 19.6% U.S. GDP; 18.6% U.S. pop]
- + WGA Clean and Diversified Energy Initiative [$\approx$ 34.7% U.S. GDP; 33.2% pop]
- Powering the Plains [$\approx$ 4.9% U.S. GDP; 5.1% U.S. population]¹⁵⁷

¹⁵⁷ GDP figures derived from News Release, Bureau of Economic Analysis, Gross Domestic Product (GDP) by State, 2006 (June 7, 2007), *available at* http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm; population figures derived from U.S. CENSUS BUREAU, U.S. CENSUS 2000 tbl.2 (2000), *available at* <http://www.census.gov/population/www/cen2000/respop.html>.

Regional Greenhouse Gas Initiative (RGGI): A consortium of nine states working toward the implementation of a cap-and-trade program aimed at reducing the CO₂ emissions from Northeastern power plants (it may be extended to cover other emissions sources in the future).¹⁵⁸ The first mandatory compliance period, which requires annual emissions reporting, begins in 2009; a full evaluation of power plant performance is to be done in 2012.¹⁵⁹ Compliance with the emissions cap set by the initiative will be enforced by the state environmental agencies.¹⁶⁰ Participants in RGGI currently include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, and Vermont.¹⁶¹ The District of Columbia, Massachusetts, Pennsylvania, Rhode Island, the Eastern Canadian Provinces, and New Brunswick are observers in the process.

Western Climate Initiative (WCI): A collaboration between western states and provinces (established in February, 2007) to set regional greenhouse gas emissions goals, develop a multi-sector market-based mechanism to support targeted emissions reductions, and participate in a greenhouse gas emissions registry to enable tracking, management, and crediting to reduce greenhouse gas emissions. The initiative has an aggregate emissions reduction goal of 15% below 2005 levels by 2020.¹⁶² Members of WCI also either have adopted or are committed to adopting clean tailpipe standards for the regulation of automobile emissions.¹⁶³ Arizona, California, New Mexico, Oregon, Utah, Washington, and the Canadian provinces of British Columbia and Manitoba are members of the Initiative.¹⁶⁴ Colorado, Kansas, Nevada, and

¹⁵⁸ Regional Greenhouse Gas Initiative (RGGI), About RGGI, <http://www.rggi.org/about.htm>.

¹⁵⁹ REGIONAL GREENHOUSE GAS INITIATIVE, RGGI OVERVIEW (Dec. 20, 2005), *available at* <http://www.rggi.org/agreement.htm>.

¹⁶⁰ REGIONAL GREENHOUSE GAS INITIATIVE, FREQUENTLY ASKED QUESTIONS (Dec. 20, 2005), *available at* <http://www.rggi.org/agreement.htm>.

¹⁶¹ REGIONAL GREENHOUSE GAS INITIATIVE, MEMORANDUM OF UNDERSTANDING (Dec. 20, 2005), *available at* <http://www.rggi.org/agreement.htm>; REGIONAL GREENHOUSE GAS INITIATIVE, SECOND AMENDMENT TO MEMORANDUM OF UNDERSTANDING (Apr. 20, 2007), *available at* <http://www.rggi.org/agreement.htm>.

¹⁶² Western Climate Initiative, Statement of Regional Goal (Aug. 22, 2007), *available at* http://www.westernclimateinitiative.org/WCI_Documents.cfm.

¹⁶³ Western Regional Climate Action Initiative (Feb. 26, 2007), *available at* http://www.governor.wa.gov/news/2007-02-26_WesternClimateAgreementFinal.pdf; U.S. Dep't of Energy, Office of Energy Efficiency and Renewable Energy, Utah Joins Western Climate Initiative (May 22, 2007), http://www.eere.energy.gov/states/news_detail.cfm/news_id=10987.

¹⁶⁴ Western Climate Initiative, <http://www.westernclimateinitiative.org/>.

Wyoming are currently participating as observers in the WCI, as well as the Canadian provinces of Ontario, Saskatchewan, and Quebec, and the Mexican state of Sonora.¹⁶⁵

Other Regional Initiatives: Several other regional initiatives help coordinate the greenhouse gas emissions reduction efforts of multiple states. Some of these are listed here:

- *Powering the Plains:* A roadmap and policy directive aimed at enabling states of the upper Midwest to transition to a carbon-neutral energy infrastructure by 2055. Primarily involves Iowa, Manitoba, Minnesota, North Dakota, South Dakota, and Wisconsin.¹⁶⁶
- *Western Governors' Association Clean and Diversified Energy Initiative:* The Western Governor's Association initiative to support expansive development of energy efficiency, renewable energy resources, and advanced coal systems, including the management and reporting of progress toward outlined goals.¹⁶⁷
- *U.S. Mayors Climate Protection Agreement:* An agreement between municipalities to reduce carbon emissions and support energy conservation and efficiency programs. Currently participating are over 530 mayors from all 50 states and the District of Columbia, representing more than 66 million people.¹⁶⁸

Mandatory State Statutes and Regulations Regarding Greenhouse Gas Emissions

California's Global Warming Solutions Act of 2006 (AB 32):¹⁶⁹ The primary purposes of the bill are two-fold: (1) to establish a statewide greenhouse gas emissions cap of 1990 levels by 2020, and (2) to require the development of mandatory emissions reporting rules—to be implemented by January 1, 2008—in order to facilitate the management of emissions reduction

¹⁶⁵ Press Release, Western Climate Initiative, Western Climate Initiative Members Set Regional Target to Reduce Greenhouse Gas Emissions (Aug. 22, 2007).

¹⁶⁶ POWERING THE PLAINS, INTRODUCTION (undated), available at <http://www.gpisd.net/ptp/documents/Overview.pdf>.

¹⁶⁷ Western Governors' Association, Policy Resolution 06-10 (June 11, 2006), available at <http://www.westgov.org/wga/policy/06/clean-energy.pdf>.

¹⁶⁸ Seattle Mayor Nickels, U.S. Mayors Climate Protection Agreement, <http://www.seattle.gov/mayor/climate/>.

¹⁶⁹ Text of the Act is available from the California Air Resources Board, <http://www.arb.ca.gov/cc/cc.htm>.

programs, including market-based mechanisms. Any mechanisms employed in order to reduce emissions are to be consistent and able to be integrated with other state or regional initiatives. This means, among other things, that the cap-and-trade system that is developed under AB 32 and by Executive Order of the governor must be able to be tied to the RGGI trading system.

Hawaii's Statewide Greenhouse Gas Emissions Cap (H.B. 226, 2007). This law establishes a statewide cap on greenhouse gas emission providing that the emissions be reduced to 1990 levels or lower by 2020 and providing for implementing regulatory authority to achieve the goal.

New Jersey's Global Warming Response Act (A3301/S2114, *signed into law* July 6, 2007): Sets statewide emissions caps on greenhouse gases at 1990 levels by 2020 and 80% below that by 2050. The Act requires New Jersey's Department of Environmental Protection to establish greenhouse gas emissions inventories, prioritize sources for greenhouse gas emissions reductions, and adopt rules and regulations to achieve those reductions.

Power Sector Regulation: Several states have policies to reduce greenhouse gas emissions from the power sector. A few examples follow:

- *California*: SB 1368, signed into law on September 29, 2006, codified rulemaking processes under way in California to establish a greenhouse gas emissions performance standard for electric generating units at a rate that is no higher than the rate of emissions of greenhouse gases for combined-cycle natural gas baseload generation. Regulatory agencies implementing this law have recently established a limit of 1100 pounds of carbon dioxide per MW-hour. The standard applies to any long-term contract for baseload power of five years or more. Carbon dioxide injected in geologic formations so as to prevent the release into the atmosphere shall not be counted as emissions of the power plant and thus does constitute emissions reductions in determining compliance with the standard. These rules took effect February 1, 2007 for investment-owned utilities and very recently for municipal utilities.

- *Washington*: S.B. 6001, signed into law on May 3, 2007, enacts an emissions performance standard for baseload generation similar to California's S.B. 1368. Under the standard, all baseload generation for which utilities enter into long-term contracts must meet a greenhouse gas emissions standard of 1,100 pounds CO₂ per megawatt-hour, beginning on July 1, 2008.
- *Montana*: H.B. 25 creates a CO₂ emissions performance standard for electric generating units constructed after January 1, 2007. H.B. 25 prohibits the state Public Utility Commission from approving electric generating units primarily fueled by coal unless a minimum of 50% of the CO₂ produced by the facility is captured and sequestered.
- *Iowa*: The electrical utility permit process includes quantifying potential greenhouse gas emissions [S.F. 485, 82d Gen. Ass'bly, 1st Sess. (2007) (enacted)].
- *Massachusetts*: Newly established emissions performance standard for the state's power plants [310 MASS. CODE REGS. 7.29 (2007)]

States also provide for greenhouse gas emissions reductions in the power sector through other means, such as the following:

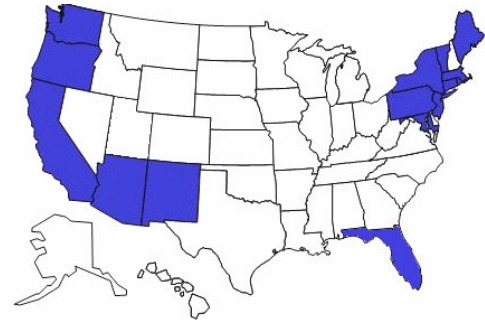
- *Public Benefit Funds*: Nearly half of states manage funds collected through utility contributions or electrical bill charges that support renewable energy or energy efficiency development and implementation.¹⁷⁰
- *Net Metering Programs*: Net metering provisions charge electricity consumers for the difference between on-site generation and offsite consumption from the grid. All but nine states have some form of net metering program, and 21 have statewide net metering.¹⁷¹

¹⁷⁰ Pew Ctr. on Global Climate Change, States with Public Benefit Funds, http://www.pewclimate.org/what_s_being_done/in_the_states/public_benefit_funds.cfm.

¹⁷¹ Pew Ctr. on Global Climate Change, States with Net Metering Programs, http://www.pewclimate.org/what_s_being_done/in_the_states/net_metering_map.cfm.

State Greenhouse Gas Emissions Standards for Motor Vehicles:¹⁷²

California adopted AB 1493 (Pavley) in 2002, directing the California Air Resources Board (CARB) to “develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles” (Sec. 3).¹⁷³ CARB promulgated rules pursuant to this directive in 2004. Since then, 14 states have moved to adopt California’s motor vehicle greenhouse gas emission regulations (colored here in blue): Arizona, Connecticut, Florida, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington.¹⁷⁴ Collectively, these states and California account for over 40% of the U.S. GDP,¹⁷⁵ and 40% of the U.S. population.¹⁷⁶



Mandatory Emissions Reporting:

- **Iowa** – passed legislation requiring mandatory greenhouse gas reporting and inventory which will be voluntarily tied to a greenhouse gas registry [S.F. 485, 82d Gen. Ass’yly, 1st Sess. (2007) (enacted)]
- **Maine** – Rules are currently in development that would append greenhouse gas emissions to required reporting under Chapter 137, the state’s Emissions Statements provisions.

¹⁷² Section adapted from Pew Ctr. on Global Climate Change, States Poised to Adopt California Vehicle GHG Standards,

http://www.pewclimate.org/what_s_being_done/in_the_states/vehicle_ghg_standard.cfm.

¹⁷³ The text of the bill is available from the California Air Resources Board,

<http://www.arb.ca.gov/cc/ab1493.pdf>.

¹⁷⁴ CONG. RESEARCH SERV., CALIFORNIA’S WAIVER REQUEST TO CONTROL GREENHOUSE GASES UNDER THE CLEAN AIR ACT 6 (Aug. 20, 2007).

¹⁷⁵ Derived from News Release, Bureau of Economic Analysis, Gross Domestic Product (GDP) by State, 2006 (June 7, 2007), *available at*

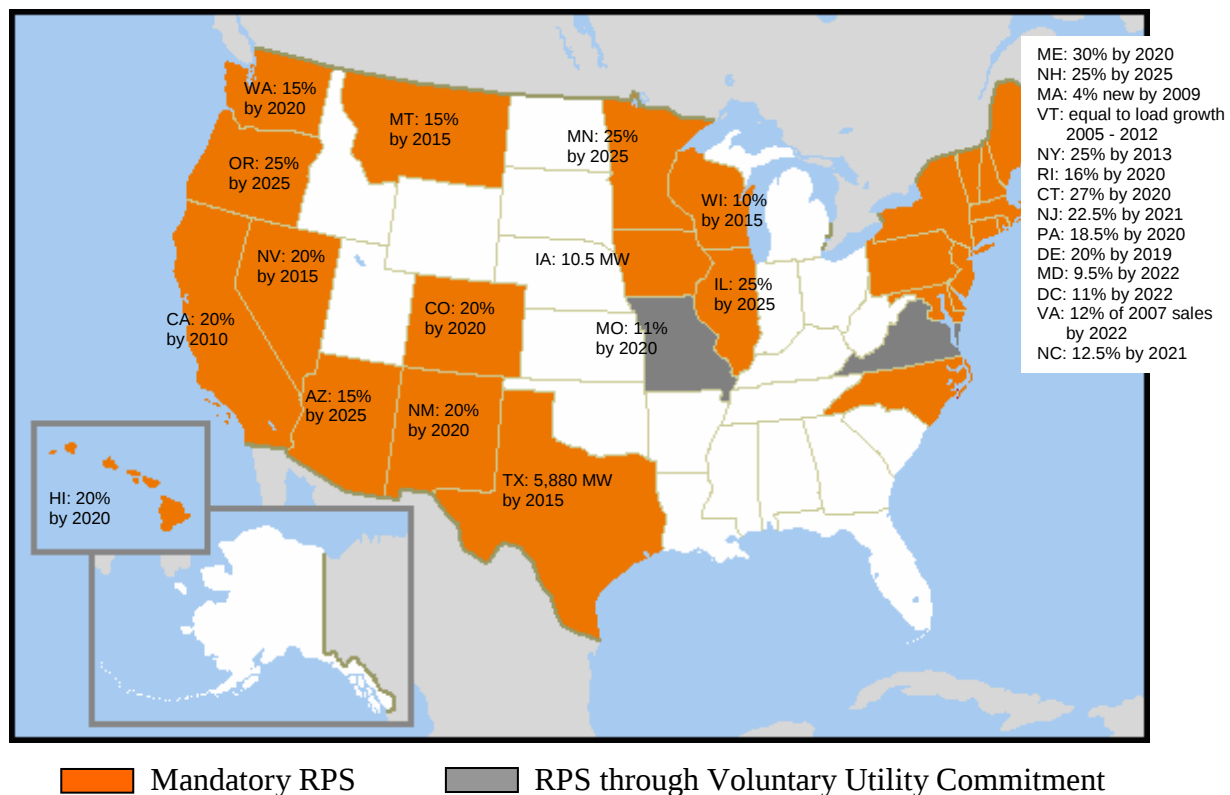
http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm; *see also* CONG. RESEARCH SERV., *supra* note 174, at 6.

¹⁷⁶ Derived from U.S. CENSUS BUREAU, U.S. CENSUS 2000 tbl.2 (2000), *available at* <http://www.census.gov/population/www/cen2000/respop.html>.

- *New Jersey* – The New Jersey Division of Air Quality expanded its Emissions Statement Program in 2003 to require reporting of CO₂ and methane from stationary emissions sources [<http://www.nj.gov/dep/aqm/ESadoption.pdf>].
- *Wisconsin* – The state’s Department of Natural Resources requires CO₂ emissions reporting beyond the threshold level of 100,000 tons per year [NR 438.03 (2005)].

Renewable Portfolio Standards:¹⁷⁷

Renewable portfolio standards (RPSs) require electrical utilities within a jurisdiction to generate a certain percentage of their electricity from renewable sources by a given deadline. To date, twenty-five states as well as the District of Columbia have adopted some form of RPS. RPSs have been adopted by states covering over 65% of the U.S. GDP and 60% of its population.



¹⁷⁷ Section adapted from Pew Ctr. on Global Climate Change, States with Renewable Portfolio Standards, http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm.

Statewide Emissions Reduction Goals¹⁷⁸

AZ: 2000 levels by 2020; 50% below 2000 levels by 2040.¹⁷⁹

CA: 2000 levels by 2010; 1990 levels by 2020; 80% below 1990 levels by 2050.¹⁸⁰

CT: 1990 levels by 2010; 10% below 1990 levels by 2020; long term reduction goal of 75% below 1990 levels.¹⁸¹

FL: 2000 levels by 2017; 1990 levels by 2025; 80% reduction of 1990 levels by 2050.¹⁸²

HI: 1990 levels by 2020.¹⁸³

IL: 1990 levels by 2020; 60% below 1990 levels by 2050.¹⁸⁴

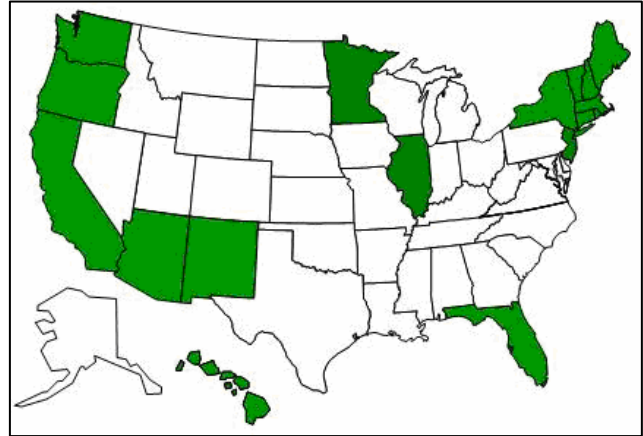
ME: 1990 levels by 2010; 10% below 1990 levels by 2020; long-term goal of 75-80% below 2003 levels.¹⁸⁵

MA: 1990 levels by 2010; 10% below 1990 by 2020; 75-85% below 1990 long-term.¹⁸⁶

MN: 15% below 2005 levels by 2015; 30% below 2005 by 2025; 80% below 2005 by 2050.¹⁸⁷

NH: 1990 levels by 2010; 10% below 1990 by 2020; 75-85% below 2001 long-term.¹⁸⁸

NJ: 1990 levels by 2020; 80% below 2006 levels by 2050.¹⁸⁹



¹⁷⁸ Adapted from Pew Ctr. on Global Climate Change, A Look at Emissions Targets: United States – State & Regional, http://www.pewclimate.org/what_s_being_done/targets.

¹⁷⁹ Exec. Order No. 2006-13.

¹⁸⁰ Exec. Order No. S-03-05.

¹⁸¹ GOVERNOR'S STEERING COMM. ON CLIMATE CHANGE, *Executive Summary*, in CONN. CLIMATE ACTION PLAN 2005, *available at* <http://www.ctclimatechange.com/StateActionPlan.html>.

¹⁸² Exec. Order No. 07-127.

¹⁸³ H.B. 226, 24th Leg. (Haw. 2007) (signed by Gov. Lingle June 30, 2007), *available at* http://www.capitol.hawaii.gov/session2007/bills/HB226_CD1_.htm.

¹⁸⁴ Press Release, Governor Rod R. Blagojevich, Gov. Blagojevich Sets Goal to Dramatically Reduce Greenhouse Gas Emissions in Illinois, Feb. 13, 2007, *available at* <http://illinois.gov/PressReleases/ShowPressRelease.cfm?SubjectID=2&RecNum=5715>.

¹⁸⁵ ME. REV. STAT. ANN. tit. 38, § 574 *et. seq.* (2006).

¹⁸⁶ COMMONWEALTH OF MASSACHUSETTS, MASSACHUSETTS CLIMATE ACTION PLAN (2004), *available at* <http://www.massclimateaction.org/pdf/MAClimateProtPlan0504.pdf>.

¹⁸⁷ S.F. No. 145, 2d Engrossment, 85th Legis. Sess. (Minn. 2007).

¹⁸⁸ N.H. DEP'T OF ENVTL. SERVS., THE CLIMATE CHANGE CHALLENGE (2001), *available at* <http://www.des.state.nh.us/ard/climatechange/challenge.pdf>.

¹⁸⁹ Exec. Order No. 54 (2007).

NM: 2000 levels by 2012; 10% below 2000 by 2020; 75% below 2000 by 2050.¹⁹⁰

NY: 5% below 1990 by 2010; 10% below 1990 levels by 2020.¹⁹¹

OR: Stabilize by 2010; 10% below 1990 levels by 2020; 75% below 1990 levels by 2050.¹⁹²

RI: 1990 levels by 2010; 10% below 1990 levels by 2020.¹⁹³

VT: 1990 levels by 2010; 10% below 1990 by 2020; 75-85% below 2001 levels long-term.¹⁹⁴

WA: 1990 levels by 2020; 25% below 1990 levels by 2035; 50% below 1990 levels by 2050.¹⁹⁵

Statewide Financial Incentives

Nearly every state in the nation has implemented some set of financial incentives to support the development and installation of renewable energy, and several have adopted incentives for energy efficiency measures. These incentives bolster the economic viability of products and services that emit fewer greenhouse gases than their traditional counterparts. These measures, ranging from taxes to grants, are outlined in the tables below.

Overview of Financial Incentives for Renewable Energy¹⁹⁶

State/Territory	Personal Tax	Corporate Tax	Sales Tax	Property Tax	Rebates	Grants	Loans	Industry Recruit.	Bonds	Production Incentive*
Alabama	1-S				4-U	1-S	1-S, 1-U			1-U
Alaska							2-S			1-U
Arizona	3-S	1-S	1-S	1-S	6-U		1-U			

¹⁹⁰ Exec. Order No. 05-033.

¹⁹¹ N.Y. STATE ENERGY PLANNING BD., STATE ENERGY PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT (ENERGY PLAN) (2002), *available at* http://text.nyserda.org/Energy_Information/energy_state_plan.asp.

¹⁹² GOVERNOR'S ADVISORY GROUP ON GLOBAL WARMING, OREGON STRATEGY FOR GREENHOUSE GAS REDUCTIONS (2004), *available at* http://sustainableoregon.org/documents/climate/Oregon_Strategy_Final_Report.pdf; H.B. 3543, 74th Legis. Assem., Reg. Sess. (Or. 2007).

¹⁹³ R.I. Greenhouse Gas Stakeholder Process, Rhode Island Greenhouse Gas Action Plan (2002), *available at* <http://righg.raabassociates.org/>.

¹⁹⁴ CLIMATE NEUTRAL WORKING GROUP, FIRST BIENNIAL REPORT TO GOV. JAMES H. DOUGLAS (2005), *available at* http://www.anr.state.vt.us/air/Planning/docs/CNWG_1st_Biennial_Report.pdf.

¹⁹⁵ Exec. Order No. 07-02.

¹⁹⁶ Database for State Incentives for Renewable Energy (DSIRE), Summary Tables: Financial Incentives for Renewable Energy, <http://www.dsireusa.org/summarytables/>.

Appendix C

State/Territory	Personal Tax	Corporate Tax	Sales Tax	Property Tax	Rebates	Grants	Loans	Industry Recruit.	Bonds	Production Incentive*
Arkansas										
California	1-S			1-S	3-S, 19-U, 1-L	1-L	1-U, 1-S			1-S
Colorado			1-S	2-S	4-U, 1-L	1-L	3-U, 1-L			
Connecticut				1-S	1-S	5-S	3-S			2-P
Delaware					1-S	2-S				
Florida		2-S	1-S		1-S, 4-U	1-S	1-U			
Georgia			1-S		3-U		4-U			1-U
Hawaii	1-S	1-S			3-U		2-U, 1-L	1-S	1-L	
Idaho	1-S		1-S			2-P	1-S		1-S	1-P
Illinois				1-S	1-S	1-P				
Indiana				1-S	4-U					
Iowa	1-S	1-S	1-S	3-S	4-U	1-S	2-S			
Kansas				1-S						
Kentucky					6-U		1-P, 3-U			1-U
Louisiana				1-S			1-S			
Maine					1-S	1-S				
Maryland	2-S	2-S	1-S	2-S	1-S, 1-L		2-S			
Massachusetts	3-S	5-S	1-S	1-S	1-S, 1-U	3-S	1-S, 1-U	1-S		1-S, 1-P
Michigan				1-S	1-U	4-S		2-S		
Minnesota			2-S	1-S	1-S, 18-U	3-U	3-S, 1-U			1-S, 3-U
Mississippi					3-U		1-S			1-U
Missouri		1-S			3-U		1-S, 1-U			
Montana	2-S	1-S		3-S	1-U	2-P, 1-U	1-S			1-P
Nebraska		1-S			3-U		1-S			
Nevada				3-S	1-S					1-S
New Hampshire				1-S	2-U		1-S			
New Jersey			1-S		2-S		1-S	1-S		1-S
New Mexico	1-S	1-S	1-S						1-S	1-U
New York	2-S	1-S	1-S	2-S	4-S, 2-U	1-S	2-S	1-S		
North Carolina	1-S	1-S		1-S			1-S			1-U, 1-P
North Dakota	1-S	1-S	1-S	2-S						
Ohio		1-S	1-S	1-S		2-S	2-S			1-S
Oklahoma		1-S						1-S		
Oregon	1-S	1-S		1-S	2-S, 10-U	2-P, 1-S	1-S, 7-U			1-P
Pennsylvania				1-S		3-S, 4-L	2-S, 5-L, 1-U			
Rhode Island	1-S		1-S	1-S	1-S, 1-U					1-P
South Carolina	1-S	2-S			1-S, 2-U		5-U			
South Dakota				2-S						
Tennessee				1-S		1-S	1-S			1-U
Texas		1-S		1-S	6-U			1-S		
Utah	1-S	1-S	1-S		1-U					
Vermont			1-S		1-S	1-U				1-U
Virginia				1-S				1-S		1-U
Washington			1-S		11-U	2-P	8-U	1-S		3-U, 1-S, 1-P
West Virginia		1-S		1-S						
Wisconsin				1-S	1-S, 3-U	1-S, 1-U	1-U			2-U
Wyoming			1-S		1-S, 1-U					
D.C.						1-S				
Totals	24	27	20	40	154	52	81	10	3	34

S = State/Territory L = Local U = Utility P = Private

Overview of Financial Incentives for Energy Efficiency¹⁹⁷

State/Territory	Personal Tax	Corporate Tax	Sales Tax	Property Tax	Rebates	Grants	Loans	Bonds
Alabama					13-U		11-U, 1-S	
Alaska					2-U		3-S	
Arizona	1-S				3-U		2-U	
Arkansas							3-U, 1-S	
California	1-S				57-U	5-U	7-U, 1-S	
Colorado					16-U	1-U	2-U	
Connecticut			1-S		14-U	2-U, 2-S	3-U, 2-S	
Delaware						2-S		
Florida					20-U	2-U, 1-S	3-U	
Georgia					15-U		12-U	
Hawaii					5-U			
Idaho	1-S				15-U		1-S, 2-U	
Illinois					2-U, 1-S	2-S		
Indiana					4-U	1-U		
Iowa					14-U	1-S	3-U, 1-S	
Kansas					1-U		1-S	
Kentucky					12-U		7-U	
Louisiana					1-U, 1-S		1-S	
Maine					1-U, 2-S		2-S	
Maryland	1-S	1-S		2-S			1-U, 2-S	
Massachusetts	2-S	2-S			27-U	1-U	6-U	
Michigan						3-S		
Minnesota					39-U	6-U	4-U, 4-S	
Mississippi					5-U		3-U, 1-S	
Missouri					8-U		2-U, 1-S	
Montana	1-S	1-S			5-U	1-U	1-U, 1-S	1-S
Nebraska					3-U		1-S	
Nevada				1-S	4-U			
New Hampshire					14-U	3-U	2-U, 1-S	
New Jersey					5-S		1-U, 2-S	
New Mexico					3-U			1-S
New York	1-S	1-S		1-S	3-U, 4-S	3-S	2-S	
North Carolina					6-U, 1-S		11-U, 1-S	
North Dakota						1-S	1-U	
Ohio					1-U	1-S	2-S	
Oklahoma	1-S				1-U		2-S	
Oregon	1-S	1-S			29-U, 5-S	1-U	13-U, 1-S	
Pennsylvania						3-S	1-U, 3-S	
Rhode Island					3-U, 2-S		2-U	
South Carolina							9-U, 1-S	
South Dakota					2-U	1-U	1-U	
Tennessee					21-U		23-U, 2-S	
Texas					26-U		5-U, 1-S	
Utah					7-U			
Vermont					3-U, 9-S		1-U, 1-S	
Virginia						1-S	3-U, 1-S	
Washington					58-U	3-U	8-U	
West Virginia						1-S		
Wisconsin					13-U, 4-S	2-U	1-U, 1-S	
Wyoming					3-U	1-S	1-U	
D.C.	1-S				1-S			
Totals	11	6	1	4	515	52	200	2

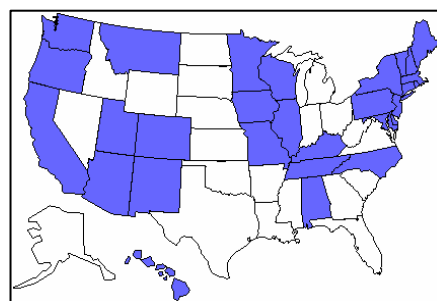
S = State/Territory U = Utility

¹⁹⁷ Database for State Incentives for Renewable Energy (DSIRE), Summary Tables: Financial Incentives for Energy Efficiency, <http://www.dsireusa.org/summarytables/>.

The U.S. Department of Energy offers an excellent state-by-state overview of energy efficiency and renewable energy endeavors at its site <http://www.eere.energy.gov/states/>.

Additional State Policies to Reduce Greenhouse Gas Emissions

Climate Action Plans:¹⁹⁸ Climate action plans provide technical and policy analysis to inform development of state greenhouse gas emissions reduction plans. Each state (colored here in blue) investigates emissions, climate liabilities and policies to develop state-specific strategies for moving forward with regulatory measures and incentives.



Greenhouse Gas Inventories:¹⁹⁹ To date, all but eight states—Alaska, Idaho, North Dakota, South Dakota, Nebraska, Wyoming, Arkansas, South Carolina—have commissioned or completed greenhouse gas inventories in order to characterize state emissions and major source categories.

Other State Actions: The sections above capture only some of the state actions concerning mitigation of greenhouse gas emissions. The table below outlines additional state level climate policies to further illustrate the diversity of these measures:

State	Greenhouse Gas Emissions Reduction/Climate Change Mitigation Measure
Alaska	• New legislation directed the establishment of the Alaska Climate Impact Assessment Commission to evaluate the risks and costs associated with global

¹⁹⁸ Pew Ctr. on Global Climate Change, States with Climate Action Plans, http://www.pewclimate.org/what_s_being_done/in_the_states/action_plan_map.cfm.

¹⁹⁹ Pew Ctr. on Global Climate Change, States with Greenhouse Gas Inventories, [http://www.pewclimate.org/what s being done/in the states/inventories map.cfm](http://www.pewclimate.org/what_s_being_done/in_the_states/inventories_map.cfm).

	climate change (AK H.C.R 30)
Arizona	• A recent executive order dedicated the state to achieving 2000-level greenhouse gas emissions by 2020, and work with other western states to establish an emissions registry and reporting mechanisms. Further requires state agencies to only purchase low-emission vehicles. [Exec. Order No. 2006-13]
California	• SB 1771 & 527 establish the California Climate Action Registry to help registrants establish emissions baselines in order to comply with present and future emissions regulations.
Colorado	• Executive Order D011 07: directs state facilities to reduce their energy consumption 20%, and state agencies to achieve a 25% volumetric reduction in petroleum consumption, by 2012. • Colorado Climate Change Markets Act (COLO. REV. STAT. § 25-1-1301 <i>et. seq.</i>): commissioning reports and establishing financial incentives for renewable energy technology research. • Law requiring electrical utilities to submit plans for installing transmission lines to untapped, high wind-capacity regions of the state.
Connecticut	• CONN. GEN. STAT. § 22a-200 to -201c (2007) – sets a statewide emissions goal of 1990 levels by 2010, orders the establishment of a greenhouse gas registry that would integrate with other states in the region; § 22a-200b(b) compels operators of any facility that is required to report air emissions data under Title V of the Federal Clean Air Act to also submit greenhouse gas emissions information to a registry; establishes a greenhouse gas labeling system for new cars; adds a “greenhouse gas reduction fee” to auto registration costs; and directs a steering committee to review vehicle emissions regulations in light of emissions reductions goals.
Delaware	• Global Warming Response Act, now awaiting approval from the Governor, sets stringent emissions reduction goals.

Idaho	• Exec. Or. 2007-05: provides for the establishment of a greenhouse gas inventory and calls for recommendations on emissions reductions.
Illinois	• Member of Chicago Climate Exchange with target of reducing emissions from government activities 6% by 2010. • Exec. Or. No. 11-2006: Establishes the Illinois Climate Change Advisory Group, orders the annual inventory of state greenhouse gases.
Maine	• 38 M.R.S. § 575 et. seq.: mandates a statewide emissions inventory and registry; sets out state emissions reduction goals. • 2007 ME. H.P. 920 (enacted): Calls for a report concerning hydro-power development including methods for evaluating current and future costs of greenhouse gas emissions and fossil fuel independence. • 35-A M.R.S. § 4711 (2006): requires natural gas utilities servicing over 5,000 residential customers to sponsor ‘cost-effective conservation programs.’
Maryland	• Exec. Or. 01.01.2007.07: Establishes a Climate Change Commission to address the drivers and causes of climate change including an impact assessment and the development of emissions reduction goals.
Minnesota	• S.F. No. 145, 2d Engrossment, 85th Legis. Sess. (Minn. 2007): sets statewide emissions reductions goals, outlines measures for energy conservation and public utility improvements for efficiency.
New Jersey	• Reclassified CO₂ as an air contaminant for the purposes of facility permitting and emissions regulation. See N.J. Dep’t of Env’tl. Prot., Div. of Air Quality, Regulatory Development, http://www.nj.gov/dep/aqm.
Oregon	• H.B. 3543 establishes stringent, statewide greenhouse gas emissions goals and directs the Oregon Global Warming Commission to develop policy recommendations to support the achievement of those goals including the

	possible creation of a statewide cap-and-trade program.
South Carolina	Established the Governor's Climate, Energy, and Commerce Advisory Committee to develop greenhouse gas emissions reduction strategies and other policy avenues that would provide the state with economic opportunities.
West Virginia	S.B. 337 (W. VA. CODE R. § 22-5-19) concerning a greenhouse gas emissions inventory.
Wisconsin	Office of Energy Independence established to bolster the biofuels industry and support energy efficiency and energy independence initiatives.

Other Resources

The compilation of state actions presented above is in no way exhaustive. It is merely illustrative of the numerous, far-reaching state actions to reduce greenhouse gas emissions. A number of frequently updated online resources further describe state-level climate policies:

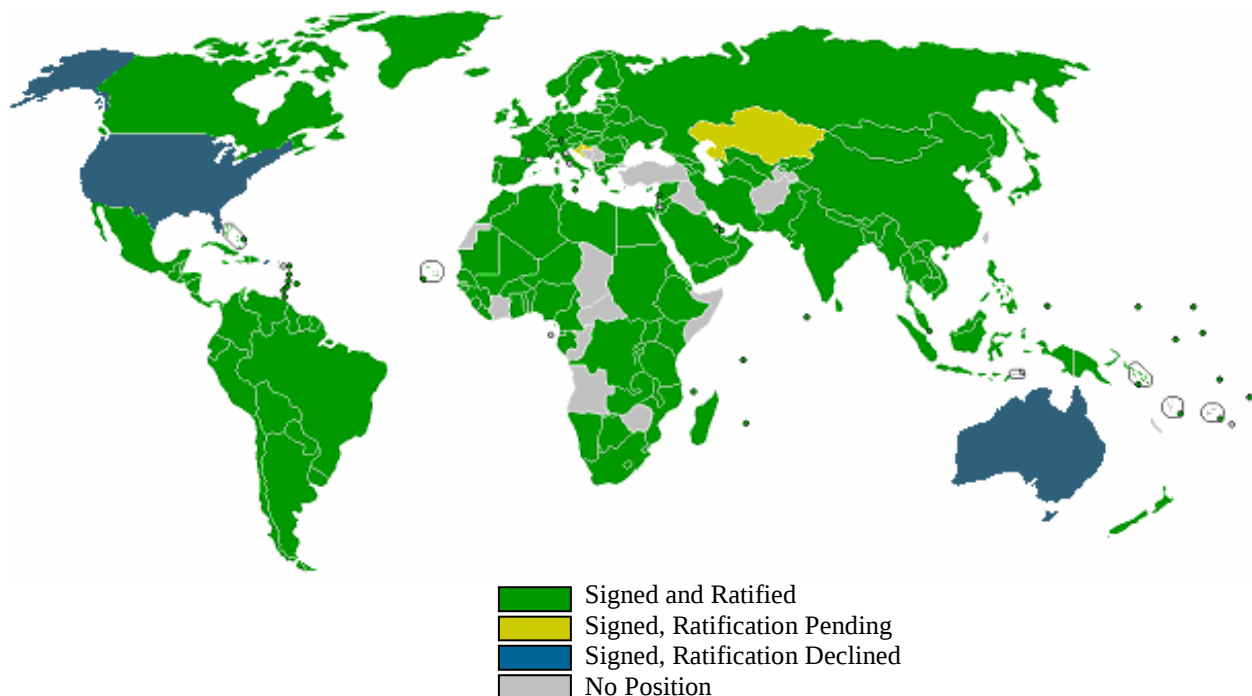
- The Pew Center on Global Climate Change collects information on state progress toward climate change mitigation at http://www.pewclimate.org/what_s_being_done/in_the_states. The Center has also compiled an overview report on such actions: PEW CTR. ON GLOBAL CLIMATE CHANGE, CLIMATE CHANGE 101: STATE ACTION (2006), *available at* http://www.pewclimate.org/docUploads/101_States.pdf.
- The Database of State Incentives for Renewables & Efficiency (DSIRE), published by the Interstate Renewable Energy Council, provides information on incentive programs to bolster the use of energy efficiency and renewable energy. *See* <http://www.dsireusa.org/>.
- The Office of Energy Efficiency and Renewable Energy of the U.S. Department of Energy publishes a number of state activities on state-specific web pages. *See* http://www.eere.energy.gov/states/state_information.cfm.
- The State Environmental Resource Center acts a clearing house for state action measures, publishing both overviews and analyses. *See* <http://www.serconline.org/>.
- National Caucus of Environmental Legislators (NCEL), <http://www.ncel.net/>.

NATIONWIDE AND INTERNATIONAL REGULATION OF GREENHOUSE GAS EMISSIONS

International Agreements on Greenhouse Gas Emissions Reduction

Kyoto Protocol: A broadly ratified treaty developed under the United Nations Framework Convention on Climate Change which establishes legally binding targets and mechanisms for effecting global reductions in greenhouse gas emissions.²⁰⁰ The Protocol achieves its goals through three mechanisms that allow for the international trade of emissions credits, grant industrialized countries emissions credits by financing projects in developed “transition economies” like those of eastern Europe, and structure financing mechanisms for emissions-avoidance or emissions-reduction projects in developing countries.²⁰¹

*Kyoto Protocol Ratification Status (as of December 2006)*²⁰²



²⁰⁰ See U.N. Framework Convention on Climate Change (UNFCCC), Essential Background, http://unfccc.int/essential_background/items/2877.php.

²⁰¹ See U.N. Framework Convention on Climate Change (UNFCCC), The Kyoto Protocol, http://unfccc.int/kyoto_protocol/background/items/2878.php.

²⁰² See ROBERT J. KEATING ET AL., ENERGY & ENVTL. SEC. INITIATIVE, GREENHOUSE GAS EMISSIONS TRADING: EMERGING MARKETS AND OPPORTUNITIES FOR COLORADO 21-22 (Mar. 2007), *available at* http://www.colorado.edu/law/eesi/CO_GHG_Trading_Report.pdf.

The Kyoto Protocol places responsibility on individual countries to mitigate greenhouse gas emissions proportional to their respective historical emissions. As such, industrialized countries with mature economies have more stringent emissions reduction requirements than do countries with transition economies. Developing countries are not required to achieve reductions in greenhouse gas emissions. The Kyoto Protocol entered into force in February of 2005.

European Union Emissions Trading Scheme (EU ETS): Established in order to achieve Kyoto-established emissions reduction goals, the EU ETS is a downstream, company level, greenhouse gas emissions trading system organized under the auspices of the European Union. It currently covers nearly 12,000 installations in 25 countries and across six major industrial sectors.²⁰³ Countries participating in the trading scheme are responsible for allocating and regulating those GHG emissions allowances granted them by the Kyoto Protocol.²⁰⁴ Emissions permits traded on the EU ETS are granted only if satisfactory monitoring and reporting mechanisms are in place.²⁰⁵

Asia-Pacific Partnership on Clean Development and Climate (AP6): The six partner countries—Australia, China, India, Japan, Republic of Korea, and the United States—represent about half of the world’s economy, population, and energy use. The Partnership strives to expand investment and trade in clean energy technologies, goods, and services, focusing on key market sectors.²⁰⁶ The Partnership is without legally binding commitments for greenhouse gas emissions reductions. It provides a multinational forum for advancing technology development. Canada has expressed interest in joining the partnership, and that country’s membership is currently under consideration.²⁰⁷

²⁰³ *Id.* at 16-17.

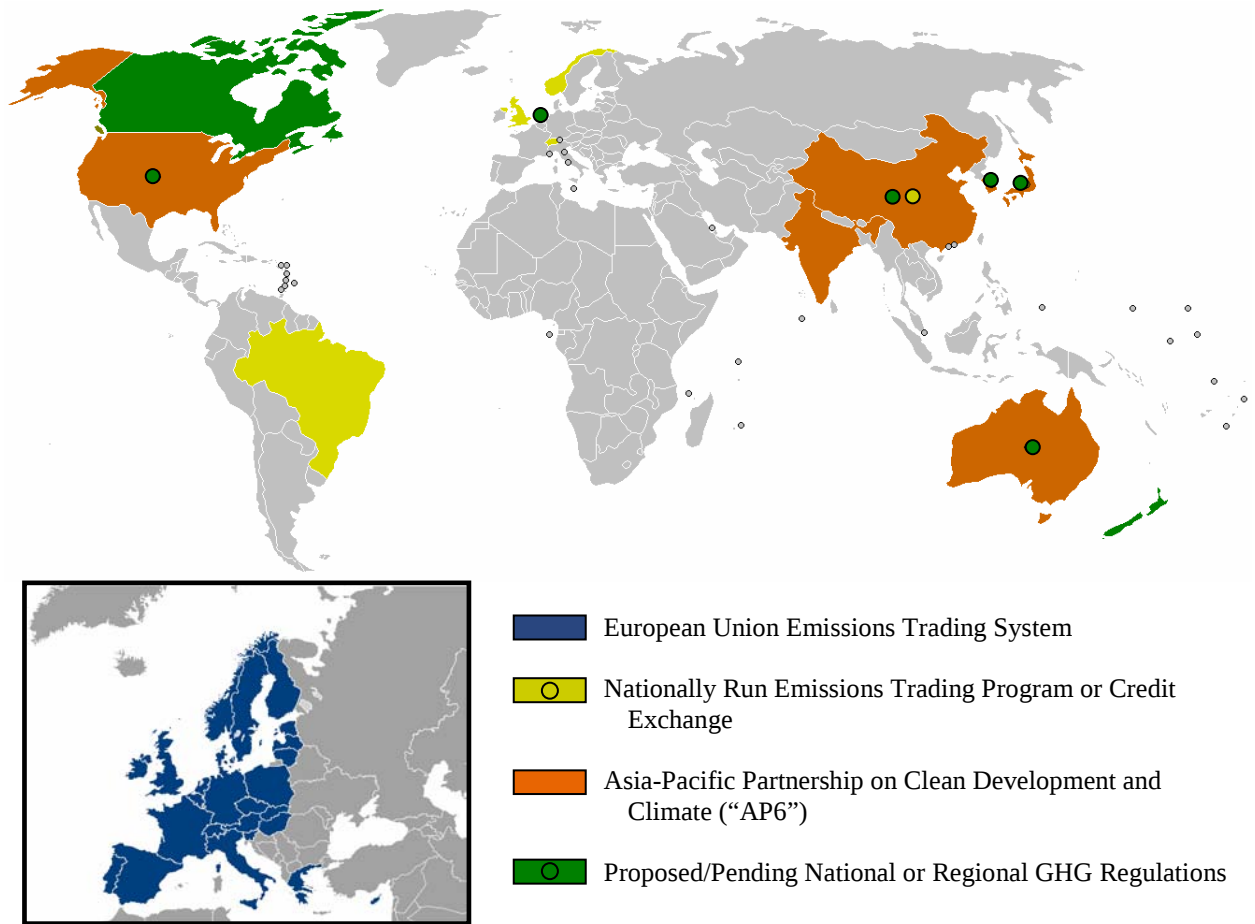
²⁰⁴ See Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003, 2003 O.J. (L 275) 32 [hereinafter Emissions Trading Directive].

²⁰⁵ See *id.* at 35.

²⁰⁶ See Asia-Pacific P’ship on Clean Dev. & Climate, <http://www.asiapacificpartnership.org/>.

²⁰⁷ See Toshio Aritake, *Meeting of Asia-Pacific Climate Partnership Considers Pilot Projects; Canada May Join*, 30 INT’L ENV’T REP. (BNA) at 584 (July. 25, 2007).

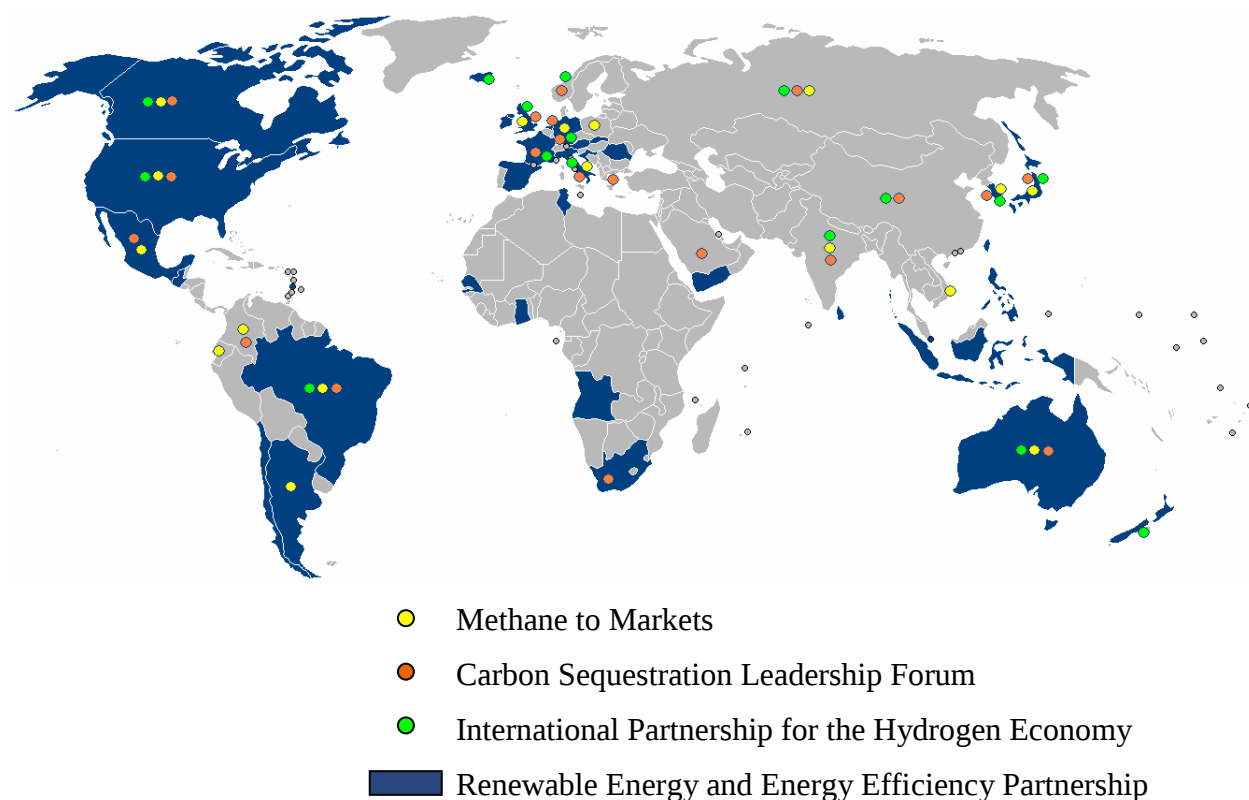
*Trading of GHG Emissions Credits & Partnerships on Climate Change*²⁰⁸



There are several other international partnerships that focus on mitigating global warming pollution by encouraging the development of specific technology markets and changes in energy infrastructure. Like the AP6, these partnerships do not include binding goals. However, they do indicate national interest on the part of their member states to effect emissions reductions and facilitate the development of new business opportunities over carbon-intensive products and services.

²⁰⁸ See KEATING ET AL., *supra* note 202, at 21-25.

Other International Climate-Related Partnerships and Market Efforts



Methane to Markets: A partnership of twenty countries to encourage the development and implementation of methane capture technologies for energy production and climate change mitigation. [www.methanetomarkets.org]

Carbon Sequestration Leadership Forum (CSL Forum): An international climate change initiative focused on the development of cost-effective means for the capture and long-term sequestration of CO₂ emissions. CSL Forum has twenty-one member states along with the European Commission. [www.cslforum.org]

International Partnership for the Hydrogen Economy (IPHE): A partnership established in 2003 of sixteen countries committed to accelerating the development of hydrogen and fuel cell technologies. [www.iphe.net]

Renewable Energy and Energy Efficiency Partnership (REEEP): With a membership of 36 governments as well as NGO and multinational businesses, REEEP is a prominent partnership that funds projects and analyzes policy mechanisms to encourage renewable energy and energy efficiency. [www.reeep.org]

International Dialogues on Climate Change

- *Vienna Climate Change Talks*, August 27-31, 2007 – This conference was held under the auspices of the U.N. Framework Convention on Climate Change and attended by over 900 delegates of the Parties to the Convention. The conference addressed how a global post-Kyoto climate policy will be negotiated and reached "agreement on key elements for an effective international response to climate change."²⁰⁹
- *Heiligendamm Summit*, June 7-8, 2007 – A G8 summit that included the world's five largest developing economies (Brazil, China, India, Mexico, and South Africa) in discussions concerning post-2012 international climate change policy. The summit reiterated the participating countries' dedication to mitigating climate change and outlined commitments to cooperate in certain fields including cross-border development, research and development, energy infrastructure revision, and sustainable development, especially in Africa.²¹⁰ The group committed to consideration of an emissions reduction goal of halving current emissions by 2050.²¹¹

²⁰⁹ Press Release, UNFCCC Secretariat, Vienna UN Conference Shows Consensus on Key Building Blocks for Effective International Response to Climate Change (Aug. 31, 2007), *available at* http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/20070831_vienna_closing_press_release.pdf; *see also* U.N. Framework Convention on Climate Change, Vienna Climate Change Talks 2007, http://unfccc.int/meetings/intersessional/awg_4_and_dialogue_4/items/3999.php.

²¹⁰ *See* Joint Statement by the German G8 Presidency and the Heads of State and/or Government of Brazil, China, India, Mexico and South Africa on the Occasion of the G8 Summit in Heiligendamm, Germany, 8 June 2007, *available at* http://www.g-8.de/Content/EN/Artikel/_g8-summit/anlagen/o5-erklaerung-en,property=publicationFile.pdf.

²¹¹ Stephen Gardner, *Summit Discussions Conclude with Pledge by Developing Nations, G-8 to Do 'Fair Share'*, 30 INT'L ENV'T REP. (BNA) at 482, June 13, 2007.

- *United Nations Climate Change Conference*, Nairobi, Nov. 6-17, 2006 – This conference assessed progress of the implementation of the Kyoto Protocol, and hosted the twelfth session of the Conference of the Parties to the Climate Change Convention.²¹²
- *Climate Dialogue at Pocantico*, September 2005 – A convening of senior policymakers and stakeholders from 15 countries to develop options and recommendations for policy approaches to mitigate global climate change.²¹³
- *Gleneagles Summit*, July 6-8, 2005 – A G8 summit focusing on climate change, clean energy, and sustainable development. The adopted plan of action identified several methods to promote renewable energy and energy efficiency. These include, *inter alia*, reviewing building codes and vehicle standards to identify best practices, adopt market-based policy frameworks to finance the transition to cleaner energy sources, and encourage multilateral development banks to consider a project's greenhouse gas intensity.²¹⁴

Foreign Greenhouse Gas Emissions Regulations and Climate Change Mitigation Schemes

Included below are brief overviews of the steps some countries are taking to mitigate global climate change. This summary compilation is provided to illustrate the extensive diversity and number of such legislative and other regulatory measures internationally.

Australia: On June 3, 2007, Australia's Prime Minister announced that the country would be implementing an emissions reduction and trading system that will have broad coverage

²¹² See U.N. Framework Convention on Climate Change, United Nations Climate Change Conference – Nairobi 2006, http://unfccc.int/meetings/cop_12/items/3754.php; see also Pew Ctr. on Global Climate Change, COP 12 and COP/MOP 2 Nairobi, http://pewclimate.org/what_s_being_done/in_the_world/cop12/.

²¹³ See Pew Ctr. on Global Climate Change, Climate Dialogue at Pocantico, <http://pewclimate.org/pocantico.cfm>.

²¹⁴ See Pew Ctr. on Global Climate Change, Summary of G8 Summit, http://pewclimate.org/policy_center/international_policy/summary_of_g8.cfm.

of greenhouse gas emissions sources and the capability to be tied to other national or international trading programs. Trading is set to begin no later than 2012.²¹⁵

Brazil: In conjunction with the World Bank and a Japanese bank, Brazil will be launching a carbon exchange in September 2007 to auction off carbon emissions credits obtained under the Clean Development Mechanism of the Kyoto Protocol.²¹⁶

Canada: John Baird, Canadian Environment Minister, formally proposed a greenhouse gas emissions reduction plan in April of 2007, setting its sights on a 20% reduction from current levels by 2020. The plan includes a regulatory framework and enforcement mechanisms to ensure reduction goals are met.²¹⁷ Additionally, the province of Quebec will implement a tax on carbon dioxide emissions in October of 2007.²¹⁸

China: In June of 2007, China issued a national plan to reduce the nation's greenhouse gas emissions. The plan does not include mandatory caps, but discusses future adoption of tax incentives and low-interest loans to encourage clean development.²¹⁹ Further, China announced in February of 2007 that it would launch the developing world's first carbon credit exchange in collaboration with the United Nation's Development Program.²²⁰

Germany: In May of 2007, Environment Minister Sigmar Gabriel unveiled an eight-point plan for reducing Germany's greenhouse gas emissions 40% from 1990 levels by 2020. The plan includes efforts to increase the efficiency of cogeneration power plants and motor vehicles,

²¹⁵ See Dep't of the Prime Minister & Cabinet, Australian Gov't, Climate Change, http://www.pmc.gov.au/climate_change/index.cfm.

²¹⁶ See *Carbon Trading: Brazil Opens Carbon Exchange*, CLIMATE CHANGE CORP.COM, Aug. 2, 2007, <http://www.climatechangecorp.com/content.asp?ContentID=4885>.

²¹⁷ See Peter Menyasz, *Canada Proposes New Framework to Cut Greenhouse Gas Emissions, Air Pollutants*, 30 INT'L ENV'T REP. (BNA) at 334, May 2, 2007.

²¹⁸ See *Canada's Quebec Province Plans Carbon Tax*, 30 INT'L ENV'T REP. (BNA) at 470, June 13, 2007.

²¹⁹ See Kathleen E. McLaughlin, *China Plan Emphasizes Energy Efficiency; Country Will Not Support Mandatory Targets*, 30 INT'L ENV'T REP. (BNA) at 471, June 13, 2007.

²²⁰ See KEATING ET AL., *supra* note 202, at 25; Kathleen E. McLaughlin, *China to Establish GHG Emissions Exchange with U.N. in Bid to Spur Clean Development*, 30 INT'L ENV'T REP. (BNA) at 163, Feb. 21, 2007.

as well as boost the percentage of renewable energy in the nation's overall use from 12 to 20%.²²¹

Japan: The Japanese government announced plans in February of 2007 to establish mandatory emissions-reduction targets for industry and develop a trading platform for greenhouse gas emissions credits.²²² Japan has also unveiled a program to promote energy efficiency to be jointly implemented by the government and industry. The program will focus on the utilization of cutting edge technology in several sectors to capture energy from existing industrial process, and retrofit energy-intensive processes.²²³ Additionally, the Tokyo municipal government will soon impose compulsory CO₂ emissions reduction targets on large sources within the city, including factories and office buildings. The program involves tax breaks for companies meeting the reduction goals and penalties for those exceeding the targets. It will later be expanded to cover smaller emissions sources.²²⁴ Finally, Japan has announced that the global environment and climate change will be at the center of next year's Group of Eight summit.²²⁵

New Zealand: New Zealand has announced its goal to be a carbon neutral nation.²²⁶ To this end, the government has released a number of proposals for public comment, including energy efficiency and conservation strategies, sustainable land management measures, and transitional strategies to move toward low-emissions electricity production. As Jim Anderton, New Zealand Minister for Agriculture and Forestry, noted: "Climate change presents a very real threat not only to the way we use our land, but to our international markets Already there is talk in Europe of border taxes on goods from countries that aren't taking effective action to

²²¹ See Niels Sorrells, *German Environment Minister Unveils Plan to Cut Carbon Emissions 40 Percent by 2020*, 30 INT'L ENV'T REP. (BNA) at 324, May 2, 2007.

²²² See *Japan Plans to Launch Emissions Trading Platform*, 30 INT'L ENV'T REP. (BNA) at 204, Mar. 7, 2007.

²²³ See *Japan Plans to Promote Energy Efficient Technology*, 29 INT'L ENV'T REP. (BNA) at 742, Oct. 4, 2006.

²²⁴ See Toshio Aritake, *Tokyo Considers Mandatory Limits for Large Carbon Dioxide Emitters*, 30 INT'L ENV'T REP. (BNA) at 474, June 13, 2007.

²²⁵ See Nancy Ognanovich & Stephen Gardner, *Japan Plans to Make Environment Focus of Next Year's G-8 Summit*, 30 INT'L ENV'T REP. (BNA) at 483, June 13, 2007.

²²⁶ See Eduard Goldberg, *New Zealand Prime Minister Announces Plans to Make Country 'Carbon Neutral'*, 30 INT'L ENV'T REP. (BNA) at 166, Feb 21, 2007.

address climate change. It's in our economic interest to be part of the global response to climate change. We need to take action to reduce the risks.”²²⁷

Norway: In April of 2007, Norwegian Prime Minister Jens Stoltenberg outlined his government's plans to make the country entirely greenhouse gas neutral by 2050. He further expressed a desire to lead the way in developing a new, binding, and truly global treaty for the reduction of greenhouse gas emissions to succeed the Kyoto Protocol.²²⁸ The country has also implemented a sales tax on passenger vehicles which is calculated relative to the car's carbon dioxide emissions.²²⁹

Switzerland: Switzerland announced it will impose a tax on certain fossil fuels starting in 2008 in order to help achieve greenhouse gas emissions reduction goals. The tax will be levied on imported heating oil and natural gas.²³⁰

United Kingdom: The United Kingdom has developed a National Allocation Program in accordance with the EU ETS Directive. These regulations cover installations involved in energy activities, the production and processing of ferrous materials, mineral processing, and paper and wood pulp production.²³¹ To this end, the Government has published a code of best practice for trading emissions credits.²³² Further, the U.K.'s Climate Change Bill, proposed in March of 2007, is currently under consideration. It would, if implemented, require future UK governments to commit to greenhouse gas emissions reductions by establishing rolling, 5-year term emissions reduction targets.²³³ The U.K. has also adopted an Energy Efficiency Commitment Program

²²⁷ Eduard Goldberg, *New Zealand Proposals to Reduce Emissions Consider Incentives for Agriculture, Forestry*, 30 INT'L ENV'T REP. (BNA) at 41, Jan. 10, 2007.

²²⁸ See Marcus Hoy, *Norwegian Prime Minister Announces Plans to Cut Carbon Emissions to Zero by 2050*, 30 INT'L ENV'T REP. (BNA) at 325, May 2, 2007.

²²⁹ See Marcus Hoy, *Norway Revises Vehicle Purchase Tax to Target Carbon Dioxide Emissions*, 30 INT'L ENV'T REP. (BNA) at 67, Jan. 24, 2007.

²³⁰ See Daniel Pruzin, *Switzerland to Impose Carbon Dioxide Tax After Missing Emissions Reduction Target*, 30 INT'L ENV'T REP. (BNA) at 539, June 11, 2007.

²³¹ See KEATING ET AL., *supra* note 202, at 19.

²³² See Tom Blass, *Britain Drafts Standard for Buying, Selling Voluntary Greenhouse Gas Emissions Offsets*, 30 INT'L ENV'T REP. (BNA) at 66, Jan. 24, 2007.

²³³ See Dep't for Env't, Food, & Rural Affairs, U.K. Legislation: Climate Change Bill, <http://www.defra.gov.uk/environment/climatechange/uk/legislation/index.htm>; Tom Blass, *U.K. Bill*

which encourages energy companies to implement efficiency measures utilizing market influences, a program highly praised by the International Energy Agency.²³⁴ Additionally, the Mayor of London introduced a plan to cut the city's CO₂ emissions 60% by 2050 by using a suite of financial incentives.²³⁵

Other Resources

- The Energy & Environmental Security Initiative has compiled a database of thousands of bilateral and multinational agreements concerning energy and the environment, with many of these focused on the development and installation of renewable energy technologies and conservation measures. See <http://lawweb.colorado.edu/eesi/>.
- The Pew Center on Global Climate Change has several analytic reports and policy overviews on international dialogues surrounding GHG emissions and climate change mitigation. See http://pewclimate.org/what_s_being_done/in_the_world.

Envisions Five-Year Carbon Budgets to Achieve 60 Percent Reduction by 2050, 30 INT'L ENV'T REP. (BNA) at 218, Mar. 21, 2007.

²³⁴ See Int'l Energy Agency, *Overview*, in ENERGY POLICIES OF IEA COUNTRIES – THE UNITED KINGDOM: 2006 REVIEW (2007), available at <http://www.iea.org/w/bookshop/add.aspx?id=299>; U.K. *Energy Efficiency Program Seen as Model*, 30 INT'L ENV'T REP. (BNA) at 192, Mar. 7, 2007.

²³⁵ See Tom Blass, *London 'Climate Change Action Plan' Offers Measures to Cut Emissions from All Sources*, 30 INT'L ENV'T REP. (BNA) at 184, Mar. 7, 2007.

FEDERAL LEGISLATION RELATED TO CLIMATE CHANGE PENDING IN THE 110TH CONGRESS

— In the Senate —

S. 280 Climate Stewardship and Innovation Act of 2007 (McCain-Lieberman)

- Covers electric power, industrial, and commercial sectors of U.S. economy.
- Establishes a program for reduction of greenhouse gases (GHGs) in covered entities through a market system of tradable allowances. One tradable allowance is necessary for each metric ton of emissions.
- Declining cap for GHG emissions beginning in 2012:
 - o 2012: cap at 2004 levels
 - o 2020: cap at 1990 levels
 - o 2030: cap at 20% below 1990 levels
 - o 2050: cap at 60% below 1990 levels
- Allowances can be sold, exchanged, purchased, banked (saved for future years), borrowed (against emissions reductions of up to 5 years), or offset (up to 30%).
- EPA distributes allowances to companies directly or to Climate Change Credit Corporation, which publicly auctions allowances. Funds generated from CCCC used for first generation technology implementation, assistance for low income communities, and adaptation strategies.
- Supported by Sens. McCain, Lieberman, Collins, Obama, Snowe and Lincoln.

S. 485 Global Warming Reduction Act of 2007 (Kerry)

- Creates a market-based emissions cap on global warming emissions, with a progressive declining cap beginning in 2012.
- Requires the EPA to reset passenger vehicle emission levels every 5 years.
- Requires the Secretary of Agriculture to set standards for carbon sequestration and biological offsets.
- Sets benchmarks for increasing percentages of renewable fuel in gasoline, and creates tax incentives for use of hybrid and electric vehicles.

S. 6 National Energy and Environmental Security Act of 2007 (Reid)

- Expresses the sense of Congress that the President should (a) require reduction in GHG emissions; (b) expand the use of clean energy; (c) reduce the burden on consumers of rising energy costs; (d) eliminate tax giveaways to oil industries; (e) prevent price manipulation of oil.

S. 309 Global Warming Pollution Reduction Act (Sanders)

- Directs EPA to set aggressive milestones in aggregate net levels of emissions & authorizes the EPA to create a market-based program to achieve reduction in emissions.
- Requires each fleet of automobiles by every manufacturer to meet emissions standards by 2016.
- Requires electric generating units to meet standards comparable to new natural gas generation units and requires such units to devote a percentage of electricity produced for sale from low-carbon generation.
- Establishes low-carbon generation trading program.
- Increases research into low carbon technology by 100% every year for 10 years.
- Requires raising the percentage of renewable fuel in commercial gasoline.

S. 317 Electric Utility Cap and Trade Act of 2007 (Feinstein)

- Covers all Electric Generation Units (EGUs) that (a) have a nameplate capacity greater than 25 megawatts; (b) emit GHG; (c) generate electricity for sale.
- Creates a cap for all such emissions for 2011-2020, and creates a market-system to distribute emission allowances under the Climate Action Trust Fund.
- Funds generated by the CATF are used for: (a) adaptation assistance for communities adversely affected by the act; (b) mitigating the impacts of climate change on fish and wildlife.
- Requires EPA to create regulations concerning early reduction credits for GHG reduction or sequestration from 2000 to 2010.

S. 357 Ten-in-Ten Fuel Economy Act (Feinstein) (*see also* H.R. 349)

- Requires fuel economy labeling standards to include greenhouse gas emissions information.
- Revises Corporate Average Fuel Economy (CAFE) standards for passenger cars and light trucks to gradually increase to 35 mpg by 2019.

S. Res. 30 Sense of the Senate of the need to address global warming through international agreements (Biden)

- Expresses the sense of the Senate that the U.S. should participate in negotiations under the U.N. Framework Convention on Climate Change that will establish commitments from all countries that are major contributors of greenhouse gas emissions.

— In the House of Representatives —

H.R. 6 Renewable Fuels, Consumer Protection and Energy Efficiency Act of 2007 (to be submitted to conference committee)

- This energy legislation, versions of which have passed both Houses of Congress, would establish a wide variety of requirements and incentives to increase use of renewable fuels, decrease use of fossil fuels, and promote energy conservation.

H.R. 182 Team up for Energy Independence Act (Lofgren)

- Creates a national sales tax for automobiles, rising to 80% in 2011. Automobiles that use alternative fuels are exempted from the tax.

H.R. 550 Securing America's Energy Independence Act of 2007 (McNulty)

- Extends tax credits for fuel cell technology, solar technology and residential energy efficient property expenditures.

H.R. 791 Increase Renewable Fuel Content of Gas Sold in the United States (Weller)

- Increases the percentage of renewable fuels in commercial gasoline beginning in 2013.

H.R. 620 Climate Stewardship Act of 2007 (Olver-Gilchrist)

- Requires companies in electric power, industrial, and commercial sectors of U.S. economy to participate in allowance scheme with a declining cap beginning in 2012. Companies are required to purchase 1 allowance per metric ton of GHG emitted.
- Allowances can be sold, traded, retired, borrowed, or offset.
- Companies may offset emissions reductions in verifiable international reductions.
- Funds generated by the sale of allowances are used for: (1) development of clean technology; (2) incentives for carbon sequestration; (3) restoration of habitat for fish and wildlife.
- Requires states to develop climate change impact mitigation plans.

H.R. 670 DRIVE Act (*see also* S. 339 – DRIVE Act)

- Directs the White House Office of Management and Budget to set an oil savings target and action plan to reduce dependence on foreign oil.
- Directs Secretary of Transportation to create a fuel efficiency program for passenger car and light trucks.
- Requires an increasing percentage of vehicles to be alternative fuel vehicles, redirects IRS policy to encourage alternative fuel vehicles.
- Requires Secretary of Energy to reduce federal fleet consumption of petroleum by 20%, encourage the development of plug in hybrid vehicles.

H.R. 969 Public Utility Regulatory Policies Act Amendments of 2007 (Udall, Tom)

- Requires electric utilities to increase power generated from renewable sources from 1% in 2010 to 20% in 2020.

H.R. 1300 Program for Real Energy Security Act (Hoyer)

- Creates National Commission on Energy Security and Transition to New Fuels.
- Requires increasing use of biofuels and alternative fuel vehicles.

Other Resources

Energy & Env'tl. Sec. Initiative, Climate Action Database: A Database of Major U.S. Climate Change Policy Proposals, <http://lawweb.colorado.edu/eesi/dms/>.

Pew Ctr.on Global Climate Change, Policy Analyses,
http://www.pewclimate.org/policy_center/analyses.

BUSINESS LEADERS' COMMENTS ON CLIMATE CHANGE REGULATION AND DISCLOSURE

Business leaders increasingly recognize that regulation of greenhouse gas emissions is both necessary and inevitable. 90 percent of business leaders believe that government regulation in this area is imminent, and 67 percent believe it will take place within the next eight years.²³⁶ Additionally, 93 percent consider climate change related risks when making investment decisions.²³⁷ In another recent study, 28 percent of executives cited environmental concerns, including climate change, as one of the issues likely to have the greatest impact on shareholder value in the next five years, and 87 percent of global companies indicated that global warming represents commercial risks and/or opportunities.²³⁸

I. Investment Advisors on the Impact of Climate Change on Performance

- “Global warming is likely to prove (to be) one of those tectonic forces that — like globalization or the aging of populations — gradually but powerfully changes the economic landscape.”
– John Llewellyn, Senior Economic Policy Advisor, Lehman Brothers²³⁹
- “Energy security and climate change issues will not be resolved in the foreseeable future; instead these issues will only intensify going forward. . . . These changing dynamics present investment opportunities in companies that are better positioned around the regulations or offer competitive technology solutions. For investors, solutions to these challenges present a compelling investment opportunity.”
– Merrill Lynch Report, *Energy Security and Climate Change*²⁴⁰

²³⁶ PEW CTR. ON GLOBAL CLIMATE CHANGE, GETTING AHEAD OF THE CURVE: CORPORATE STRATEGIES THAT ADDRESS CLIMATE CHANGE 1 (2006), *available at* http://www.pewclimate.org/docUploads/Synthesis_Report_CorpStrategies.pdf.

²³⁷ *Id.* at 55.

²³⁸ EDWARD M. KERSCHNER & MICHAEL GERAGHTY, CITIGROUP GLOBAL MARKETS, CLIMATIC CONSEQUENCES 68 (2007), *available at* http://sefi.unep.org/fileadmin/media/sefi/docs/industry_reports/Citigroup_2007.pdf.

²³⁹ Adam Shell & Matt Krantz, *Global Warming a Hot Spot for Investors*, USA TODAY, Feb. 28, 2007, *available at* http://www.usatoday.com/money/markets/2007-02-28-global-warming_N.htm.

²⁴⁰ MERRILL LYNCH, ENERGY SECURITY & CLIMATE CHANGE: INVESTING IN THE CLEAN CAR REVOLUTION 4 (2005), *available at* http://www.asria.org/ref/library/csrguidelines/lib/050616WRI_Report.pdf.

- “The pace of a firm’s adaptation to climate change and related policy is thus likely to prove to be another of the forces that will influence whether, over the next several years, any given firm survives and prospers; or withers and, quite possibly, dies.”
– Lehman Brothers Report, *The Business of Climate Change*²⁴¹
- “[E]nvironmental regulation will play an increasingly larger role in business in the coming years [C]ompanies that are knowledgeable about the issues, and, therefore, well-prepared, will find it easier to maintain profitability as they will be in a much better position to bid for new projects and sustain their business under the new legislation. In turn, these companies may also be able to gain market share from businesses that are less prepared and compliant.”
– J.P. Morgan Report, *Air Pollution: Business Risk or Competitive Advantage*²⁴²
- “Climate change is widely recognized as the most significant environmental issue facing the global economy Investors need to understand how their investments are contributing to the problem, and also how they could be impacted by a changing climate.”
– Henderson Global Investors Report, *The Carbon 100*²⁴³
- “(Global warming) started out as an environmental issue, but it crossed over to become a quite fundamental financial and economic issue.”
– Nick Robbins, Head of Socially Responsible Investment Funds, Henderson Global Investors²⁴⁴
- “We see a number of catalysts that will create investment opportunities related to reducing greenhouse gases and mitigating exposure to climate change risk.”
– Peter Suozzo, Director of Sustainable Investment Research for North America, Citigroup²⁴⁵

²⁴¹ JOHN LLEWELLYN, LEHMAN BROTHERS, *THE BUSINESS OF CLIMATE CHANGE: CHALLENGES AND OPPORTUNITIES 4* (2007), *available at*

http://www.lehman.com/press/pdf_2007/TheBusinessOfClimateChange.pdf.

²⁴² JP MORGAN, *AIR POLLUTION: BUSINESS RISK OR COMPETITIVE ADVANTAGE* (2007), *available at*
<http://www.jpmorgan.com/pages/jpmorgan/investbk/solutions/research/climatechange>.

²⁴³ HENDERSON GLOBAL INVESTORS, *THE CARBON 100* at 3 (2005), *available at*
http://www.henderson.com/global_includes/pdf/sri/SRICarbon100Report.pdf.

²⁴⁴ Joanna Glasner, *Investors Bet on Global Warming*, WIRED, Nov. 22, 2005, *available at*
<http://www.wired.com/techbiz/startups/news/2005/11/69370>.

²⁴⁵ Jody Yen, *Global Warming Goes to Wall Street*, FORBES.COM, Jun. 20, 2006, *available at*
http://www.forbes.com/businessinthebeltway/2006/06/19/green-business-investing-cz_jy_0619sf.html.

- “Any insurance company that is not focusing on climate change and related possible damage is not being realistic in looking at their future profitability. As an investor, a lack of disclosure always troubles me.”
– Richard Moore, North Carolina State Treasurer²⁴⁶
- “Shareholders must understand actions taken to manage GHG and climate risks.”
– Bob Page, Vice President of Sustainable Development, TransAlta²⁴⁷
- “[C]limate change is on the agenda for governments, regulators, consumers and businesses and this is creating some major risks, but also opportunities.”
– Mike Scott, *Financial Services – Banking on Climate Change’s Consequences*²⁴⁸

II. Climate Change Is a Business Reality

“Companies should take action now to define their global climate-related strategy, set GHG reduction goals and implement GHG reduction activities, not just for environmental reasons, but also for competitive advantage.” – Ron Meissen, Senior Director of Environment, Health and Safety Engineering at Baxter International²⁴⁹	“Companies are becoming increasingly aware that climate is closely tied to profits.” – Felix Carabello, Director of Alternative Investment Products, Chicago Mercantile Exchange²⁵⁰
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- “To me, [climate change] is the defining business issue of our generation.”

²⁴⁶ EVAN MILLS & EUGENE LECOMTE, CERES, FROM RISK TO OPPORTUNITY: HOW INSURERS CAN PROACTIVELY AND PROFITABLY MANAGE CLIMATE CHANGE 29 (2006), *available at* <http://www.ceres.org/pub/publication.php?pid=0>.

²⁴⁷ PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 236, at 55.

²⁴⁸ Mike Scott, *Financial Services – Banking on Climate Change’s Consequences*, CLIMATE CHANGE CORP.COM, June 18, 2007, <http://www.climatechangecorp.com/content.asp?ContentID=4852>.

²⁴⁹ PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 236, at 6.

²⁵⁰ Shell & Krantz, *supra* note 239.

- David Crane, Chief Executive Officer, NGR Energy²⁵¹
- “[A]s many companies have already learned, acting on [climate change] is simply good business. Reducing our use of energy reduces costs. Inviting our employees to be active on this issue helps us recruit and retain the world's best. For us, as a media company-- this is a chance to deepen our relationships with our viewers, readers, and web users. The [climate] initiative we are launching today will involve every business, every function. It's not only for our facilities managers or our fleet directors-- it's about how we recruit new employees, how we develop relationships with advertisers and how we design movie sets. This is about changing the DNA of our business to re-imagine how we look at energy.”
- Rupert Murdoch, Chairman and CEO, News Corporation²⁵²
- “By conserving energy, we not only help the environment, but also our bottom line, as greater energy efficiency means lower costs. By investing in renewable energy, we displace some of our electricity demand during the times of day when it is most expensive, while helping green industries grow and reducing the cost of these emerging technologies. And by creating web-based products and services, we connect individuals like you with information that helps raise environmental awareness or avoids the need for you taking that trip to the store or sending that paper in the mail.”
- Google statement on climate change²⁵³
- “Climate change is shaping global markets and global consumer attitudes. There will be winners and losers. Companies who seize the opportunities, who adopt environmental, social and governance policies and who evolve, innovate and respond to these challenges are likely to be the pioneers and industry leaders of the 21st century.”
- Achim Steiner, Executive Director, UNEP²⁵⁴

²⁵¹ John Donnelly, *Unlikely Allies Advance Global Warming Policy*, BOSTON GLOBE, Aug. 22, 2007, available at http://www.boston.com/news/nation/washington/articles/2007/08/22/unlikely_allies_advance_global_warming_policy/.

²⁵² Rupert Murdoch, Chairman and Chief Executive Officer, News Corp., Remarks at Hudson Theatre, New York City (May 9, 2007), available at http://www.newscorp.com/energy/full_speech.html.

²⁵³ Google, A Clean Energy Future @ Google, <http://www.google.com/corporate/green/energy/>. Google has committed to going carbon neutral by 2008.

²⁵⁴ Press Release, World Bus. Council for Sustainable Dev., Business Leaders Call for Climate Action (July 6, 2007), available at <http://www.wbcsd.ch/plugins/DocSearch/details.asp?type=DocDet&ObjectId=MjU0MTQ>.

- “As a major global reinsurer, Swiss Re is committed to taking a leading role in the climate debate. We identified climate change as an emerging risk some 20 years ago, and the concern has since evolved into an important component of the company’s long-term risk management strategy. Our actions are based on the premise that it is in the interest of our shareholders, clients and employees, the wider stakeholder community and society in general to tackle this issue Climate change has been designated a Swiss Re Top Topic, which means that it is recognized as an issue of Group-wide strategic importance.”
– Swiss Re statement on climate change²⁵⁵
- “Climate change is probably one of the best examples of where long-term risk planning is essential to mitigate some potentially irreversible long-term effects.”
– Brian Storms, CEO, Marsh, Inc.²⁵⁶
- “Our shareholders wanted to better understand the opportunities and risks that the climate change issue represented to their investment in Exelon, so we added a Global Climate Change Section to our 2004 10-K.”
– Helen Howes, Vice President of Environment, Health and Safety, Exelon²⁵⁷
- “We have long identified climate change as a serious environmental issue, and shareholders are increasingly asking about the risks as well as the opportunities associated with it.”
– Bill Ford, Chairman and CEO, Ford Motor Company²⁵⁸
- “The larger challenge that we face is, are we somehow in a period in which global warming is for real and we never have a cold January again. That’s the single biggest risk to our industry.”
– Aubrey McClendon, CEO, Chesapeake Energy²⁵⁹

²⁵⁵ Swiss Re, Our Position and Objectives, http://www.swissre.com/pws/about%20us/knowledge_expertise/top%20topics/our%20position%20and%20objectives.html?contentIDR=c21767004561734fb900fb2ee2bd2155&useDefaultText=0&useDefaultDesc=0.

²⁵⁶ PEW CTR. ON GLOBAL CLIMATE CHANGE, CLIMATE CHANGE 101: BUSINESS SOLUTIONS 1 (2006), *available at* http://www.pewclimate.org/docUploads/1114_BusinessFinal.pdf.

²⁵⁷ PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 236, at 54.

²⁵⁸ Nat’l Env’tl. Trust, U.S. Business Leaders on Global Warming, http://www.net.org/warming/docs/Business_Leadership_Quotes.pdf.

²⁵⁹ Audio recording: 2006 OGIS West Investment Symposium, held by the Indep. Petroleum Ass’n of Am. (Oct. 3, 2006), *available at* <http://www.investorcalendar.com/IC/CEPage.asp?ID=108780&CID=>

- “Shell was one of the first energy companies to acknowledge the threat of climate change and to call for action by governments, industries and energy users”
– John Hofmeister, U.S. Country Chair and President, Shell Oil Company²⁶⁰

III. Legislation to Mitigate Climate Change Is Inevitable

“The dam is broken It’s inevitable that the federal government will have to come out and set a level playing field throughout the country.” – Chris Walker, Head of Greenhouse Gas Risk Solutions Unit, Swiss Re²⁶¹	“The growing consensus is that national domestic regulation is a matter of when, not if.” – Paul Hanrahan, President and CEO, AES Corporation²⁶²
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- “[G]overnment mandates will be required.”
– Yolanda Pagano, Director of Climate Strategy and Programs, Exelon²⁶³
- “Congress has changed, people realize something is coming down the pike in terms of federal legislation”
– Douglas Fisher, utilities analyst, AG Edwards & Sons²⁶⁴
- “[W]e must include all voices to ensure that energy policies lower emissions and sustain global economic development.”
– Jim Owens, Chairman and CEO, Caterpillar Inc.²⁶⁵

²⁶⁰ U.S. Climate Action Partnership (USCAP), USCAP Statements, <http://www.us-cap.org/media/quotes.asp>.

²⁶¹ Nat’l Envtl. Trust, *supra* note 258.

²⁶² Press Release, AES, AES Outlines Support for National Instead of Regional CO₂ Cap and Trade Legislation (Jan. 17, 2007), *available at* <http://newsroom.aes.com/phoenix.zhtml?c=202639&p=irol-newsArticle&ID=951301&highlight=>.

²⁶³ PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 236, at 47.

²⁶⁴ David R. Baker & Zachary Coile et al., *Lobbying Effort Signals Corporate Climate Change*, S.F. CHRON., Jan. 23, 2007, *available at* <http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/01/23/CEOCLIMATE.TMP>.

²⁶⁵ USCAP, *supra* note 260.

- “We see a global system of emissions trading as inevitable.”
– Steve Lennon, Chair, Environment and Energy Commission, International Chamber of Commerce²⁶⁶
- “Technologies will emerge when CO₂ has a price signal, and that market signal will be created by regulation.”
– Kevin Leahy, Managing Director of Climate Policy, Cinergy²⁶⁷

IV. Climate Change Must Be Addressed

“We know we must address climate change [T]here is no other option.” – Alain Belda, Chairman and CEO, Alcoa²⁶⁸ “The unique challenge of climate change is that it requires action now” – Jeffry Sterba, Chairman, President and CEO, PNM Resources²⁶⁹	“Climate change is a serious issue that has to be addressed through concrete action.” – Chad Holliday, Chairman and CEO, DuPont²⁷⁰
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- “It is critical that business, government and non-governmental organizations come together to develop efficient and effective approaches to addressing environmental impacts of greenhouse gas emissions and our mutual energy future.”
– Indra K. Nooyi, Chairman and CEO, PepsiCo²⁷¹
- “[C]limate change is a serious problem that must be addressed.”
– Martin Sullivan, President and CEO, AIG²⁷²

²⁶⁶ Nat’l Envtl. Trust, *supra* note 258.

²⁶⁷ PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 236, at 47.

²⁶⁸ USCAP, *supra* note 260.

²⁶⁹ *Id.*

²⁷⁰ *Id.*

²⁷¹ *Id.*

²⁷² *Id.*

- “GM is very pleased to join USCAP in proactively addressing the concerns posed by climate change.”
– Rick Wagoner, Chairman and CEO, General Motors Corp.²⁷³
- “Climate change is real and the most urgent environmental issue our society faces.”
– Andrew Liveris, Chairman and CEO, The Dow Chemical Company²⁷⁴
- “We support the goal of reducing greenhouse gas emissions to mitigate the expected adverse effects of climate change.”
– William C. Weldon, Chairman and CEO, Johnson & Johnson²⁷⁵
- “[A]ction to address these emissions sooner rather than later will lower the costs and difficulties of mitigation and innovation.”
– Robert Lane, Chairman and CEO, Deere & Company²⁷⁶
- “[T]he sooner we act the better it will be for our environment, customers and the economy.”
– Jim Rogers, Chairman, President and CEO, Duke Energy²⁷⁷
- “[W]e are committed to tackling the challenge of global climate change.”
– George Nolen, President and CEO, Siemens Corporation.²⁷⁸
- “We believe climate change is one of the most significant environmental challenges of the 21st century [V]oluntary action alone cannot solve the climate change problem.”
– Goldman Sachs Environmental Policy Framework²⁷⁹
- “No other country bears a greater responsibility – or possesses a greater capacity – to lead the global response on this issue.”
– Peter A. Darbee, Chairman of the Board, CEO and President, PG&E Corporation²⁸⁰

²⁷³ *Id.*

²⁷⁴ *Id.*

²⁷⁵ *Id.*

²⁷⁶ *Id.*

²⁷⁷ *Id.*

²⁷⁸ *Id.*

²⁷⁹ GOLDMAN SACHS, GOLDMAN SACHS ENVIRONMENTAL POLICY FRAMEWORK 1 (undated), *available at* http://www2.goldmansachs.com/our_firm/our_culture/corporate_citizenship/environmental_policy_framework/docs/EnvironmentalPolicyFramework.pdf.

²⁸⁰ USCAP, *supra* note 260.

- “We don’t have a lot more time to deal with climate change”
– Henry Paulson, then-Chairman, Goldman Sachs²⁸¹
- “BHP Billiton has recognized that our company, as well as society generally, must make real behavioral changes and accelerate technological progress if we are to achieve a meaningful reduction in energy use and greenhouse gas emissions.”
– Chip Goodyear, CEO, BHP Billiton²⁸²
- “We have to deal with greenhouse gases. From Shell's point of view, the debate is over. When 98 percent of scientists agree, who is Shell to say, ‘Let's debate the science’?”
– John Hofmeister, President, Shell Oil Co.²⁸³
- “We support urgent but informed action to stabilize greenhouse gas (GHG) concentrations by achieving sustainable long-term emission reductions at the lowest possible cost.”²⁸⁴
– BP P.L.C. position on climate change
- “Climate change poses clear, catastrophic threats. We may not agree on the extent, but we certainly can't afford the risk of inaction.”
– Rupert Murdoch, Chairman and Chief Executive Officer, News Corporation²⁸⁵
- “In the distribution of possible future outcomes of global warming, there is a significant tail representing very serious consequences. It is the prudent approach – a common practice in insurance and issues of financial stability – which requires us to take action today to mitigate global warming and to adapt to its consequences.”
– Jacques Aigrain, Chief Executive Office, Swiss Re²⁸⁶

²⁸¹ Env'tl. & Energy Study Institute, *First Meeting of Parties to Kyoto Protocol Underway in Montreal*, CLIMATE CHANGE NEWS, Dec. 2, 2005, <http://www.eesi.org/publications/Newsletters/CCNews/12.2.05%20CCNews.htm>.

²⁸² BHP Billiton, Ltd., *BHP Billiton Launches Revised Climate Change Policy*, CSRWIRE, June 19, 2007, available at <http://www.csrwire.com/News/8939.html>.

²⁸³ [Steven Mufson & Juliet Eilperin](#), *Energy Firms Come to Terms with Climate Change*, WASH. POST, Nov. 25, 2006, available at <http://www.washingtonpost.com/wp-dyn/content/article/2006/11/24/AR2006112401361.html>.

²⁸⁴ BP, *Climate Change - Our Position*, <http://www.bp.com/sectiongenericarticle.do?categoryId=9015582&contentId=7028604>.

²⁸⁵ Murdoch, *supra* note 252.

²⁸⁶ Swiss Re, *supra* note 255.

V. Federal Legislation Concerning Climate Change Is Desirable

Thirty-three U.S. businesses and environmental groups have joined together to form the U.S. Climate Action Partnership, that have come together “to call on the federal government to enact legislation requiring significant reductions of greenhouse gas emissions.”²⁸⁷ The joint statement pledges that the corporations will “work with the President, the Congress and all other stakeholders to enact an environmentally effective, economically sustainable, and fair climate change program consistent with our principles at the earliest practicable date”²⁸⁸ and recommends “mandatory” regulations “to reduce greenhouse gas emissions.”²⁸⁹

“[T]he time has come to act – to take steps as a nation to reduce the carbon intensity of our economy . . . any actions must be mandatory, economy-wide and federal in scope.” – Paul Anderson, CEO, Duke Energy Corp.²⁹⁰	“We need a uniform and predictable system. . . . It needs to be a federal system.” – Ken Cohen, Vice-President of Public Affairs, Exxon Mobil²⁹¹
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- “[State level regulation] would be a huge misdirection of resources and much less would be achieved if we are subjected to a balkanized set of standards from 50 different sources.”
- Tom Catania, Vice President of Government Relations, Whirlpool²⁹²

²⁸⁷ U.S. Climate Action P’ship (USCAP), <http://www.us-cap.org>. Members of USCAP include Alcan Inc., Alcoa, American International Group, Inc. (AIG), Boston Scientific Corporation, BP, America Inc., Caterpillar Inc., Chrysler LLC, ConocoPhillips, Deere & Company, The Dow Chemical Company, Duke Energy, DuPont, Environmental Defense, Exelon Corporation, Ford Motor Company, FPL Group, Inc., General Electric, General Motors Corp., Johnson & Johnson, Marsh, Inc., National Wildlife Federation, Natural Resources Defense Council, The Nature Conservancy, NRG Energy, Inc., PepsiCo, Pew Center on Global Climate Change, PG&E Corporation, PNM Resources, Rio Tinto, Shell, Siemens Corporation, World Resources Institute, Xerox Corporation.

²⁸⁸ U.S. CLIMATE ACTION P’SHIP, A CALL FOR ACTION 11 (2007), *available at* <http://www.us-cap.org/USCAPCallForAction.pdf>.

²⁸⁹ USCAP, *supra* note 260.

²⁹⁰ Nat’l Env’tl. Trust, *supra* note 258.

²⁹¹ *Everybody’s Green Now: How America’s Big Companies Got Environmentalism*, ECONOMIST, May 31, 2007, *available at* http://www.economist.com/surveys/PrinterFriendly.cfm?story_id=9217982.

²⁹² PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 236, at 50.

- “[W]e support [the] goal of a mandatory national regulatory framework.”
– James J. Mulva, Chairman and CEO, ConocoPhillips²⁹³
- “We must . . . create energy policy that is integrated, coherent and clear. . . .”
– Jeffrey Immelt, Chairman of the Board and CEO, General Electric²⁹⁴
- “It is in the interest of society and business to reduce the uncertainty and increase the predictability of policy frameworks and market conditions around the issue of climate change.”
– Bill Ford, CEO, Ford Motor Co.²⁹⁵
- “Alcan is . . . committed to bringing about legislative action on climate change.”
– Richard B. Evans, President and CEO, Alcan, Inc.²⁹⁶
- “The sooner we act, the more options we have for solutions, the less costly they will be and the fewer uncertainties we will face with the climate.”
–Peter A. Darbee, Chairman of the Board, CEO and President, PG&E Corporation²⁹⁷
- “Give us a date, tell us how much we need to cut, give us the flexibility to meet the goals, and we’ll get it done.”
– Wayne H. Brunetti, CEO and Chairman, Xcel Energy²⁹⁸
- “[W]e will campaign for public policies designed to cut emissions to the levels required to keep our climate system stable. We support energy efficiency standards that accelerate the deployment of energy-efficient technologies throughout the world, specific targets to increase renewable energy supplies on the grid, public support for research and development aimed at developing and commercializing low-carbon technologies, and mandatory emissions limits that put a price on carbon.”
– Google statement on climate change²⁹⁹

²⁹³ USCAP, *supra* note 260.

²⁹⁴ *Id.*

²⁹⁵ *Id.*

²⁹⁶ *Id.*

²⁹⁷ David R. Baker & Zachary Coile, *Lobbying Effort Signals Corporate Climate Change*, S. F. CHRON., Jan 23, 2007, at D1, *available at* <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/01/23/BUGO0NN3EC1.DTL&feed=rss.news>

²⁹⁸ PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 256, at 7.

²⁹⁹ Google, *supra* note 253.

KEY ELEMENTS OF PROPOSED SEC GUIDANCE ON CLIMATE DISCLOSURE

The Commission should issue an interpretive release clarifying registrants' obligation under existing law and regulations to assess the risks they face in connection with climate change and to disclose those risks that are material. This guidance should set forth the process by which a registrant should make this assessment and the types of information most likely to be relevant to the assessment, and should direct registrants to disclose the following risks if they are material:

1. Physical risks associated with climate change;
2. Financial risks associated with present or probable regulation of greenhouse gas emissions; and
3. Legal proceedings relating to climate change.

Basis for Interpretive Release

As explained in our petition, climate change has become increasingly important to the operations and financial condition of many registrants. Developments associated with global warming, including physical changes associated with a warming climate and regulatory measures adopted to mitigate greenhouse gas emissions, can affect companies in a variety of ways, such as by posing risks to physical assets of the registrant or its customers or suppliers, introducing new regulatory compliance costs and obligations, increasing the costs of important inputs, and opening up opportunities for new products and services. Many investors are now seeking information concerning companies' response to the physical changes, regulatory developments, and new opportunities associated with climate change.

While some registrants have been providing information on the impacts of climate change in their periodic filings, disclosures remain inconsistent and in many cases incomplete. In particular, corporate disclosure of the risks posed by climate change is lacking, even for companies that do address the impact of climate change and their own emissions. The uneven state of disclosure of climate information, the pervasive emergence of global warming as a significant influence upon the economy, the numerous and complex ways in which it may bear materially on registrants' financial condition, and the widespread adoption of greenhouse gas

regulations in recent years, all indicate a need for guidance concerning registrants' disclosure obligations with respect to climate issues.

Climate-related risks that constitute material contingent liabilities must be expressed on a company's balance sheet or in footnotes to financial statements. *See* Statement of Financial Accounting Standards No. 5, *Accounting for Contingencies*. Our petition sets forth examples of climate risk that may require such treatment. *See* Petition Part 3.

Whether or not climate risk can be estimated with a degree of certainty warranting its classification as a material contingent liability, registrants have obligations under various provisions of Regulation S-K to disclose in narrative form material information regarding the physical risks associated with climate change and with governmental regulations intended to limit emissions of greenhouse gases. Registrants should carefully examine the potential implications of climate change and present or probable regulation of greenhouse gas emissions for their own operations and financial condition. Whether disclosure is required will depend, as in other areas, upon an informed judgment about whether the information is material. In addressing that question, companies should not limit their consideration merely to particular projects and sites, but should also consider whether the overall degree of risk posed by climate change is material to the corporation's long-term ability to create and maintain value for shareholders.

Several provisions of Regulation S-K have particular importance when considering the impact of climate change and related developments. As part of the narrative description of its business under Item 101, a registrant must disclose any material effects of compliance with Federal, State and local laws regulating the discharge of materials into the environment or otherwise relating to the protection of the environment may have upon the registrant's capital expenditures, earnings and competitive position. 17 C.F.R. § 229.101(c)(xii). Item 103 requires disclosures concerning certain judicial or administrative proceedings arising under laws intended to protect the environment. 17 C.F.R. § 229.103 & Instruction 5. Under Item 303, Management's Discussion and Analysis of Financial Condition and Results of Operations must include discussions of factors bearing materially on the company's financial condition and business operations, including an identification of known trends or uncertainties expected to have a material impact on the registrant's liquidity, capital resources, net sales or revenues or income from continuing operations. 17 C.F.R. § 229.303(a).

As the Commission noted in its recent guidance on MD&A disclosure, companies now have “access to and use substantially more detailed and timely information about their financial conditions and operating performance than they did when our MD&A requirements initially were introduced Some of this information is itself non-financial in nature, but bears on companies’ financial condition and operating performance.”³⁰⁰ Information bearing on the consequences of climate change and greenhouse gas regulation for a registrant’s operations and financial condition is an important part of that expanding body of information, and registrants should review it carefully and make disclosures where appropriate.

As the MD&A release observed, “in identifying, discussing and analyzing known material trends and uncertainties, companies are expected to consider all relevant information, even if that information is not required to be disclosed.”³⁰¹ In assessing the impact of climate change and greenhouse gas regulation on their financial condition and operations, registrants should examine any corporate policies or governance structures that have been established to address climate issues, and review the company’s institutional mechanisms for assembling and analyzing information about the various ways in which climate change can affect the company. Where the company has not established internal mechanisms for assembling and assessing climate information, it may need to do so in order to exercise informed judgments concerning the nature and materiality of climate-related risk.

Process for Assessment of Material Climate Risks

To assess potential financial risks associated with present and probable regulatory requirements concerning greenhouse gases, registrants should determine their current and projected emissions levels. Companies should tabulate their current greenhouse gas emissions, including direct emissions from their own operations and emissions from purchased electricity and purchased products and services. They should estimate their past greenhouse gas emissions to the extent necessary to assess significant trends in their emissions levels, and should also project their future greenhouse gas emissions, as necessary to evaluate the costs they are likely to face from greenhouse gas regulation.

³⁰⁰ Interpretation: Commission Guidance Regarding Management’s Discussion and Analysis of Financial Condition and Results of Operations, Securities Act Release No. 8350, Exchange Act Release No. 48,960, 68 Fed. Reg. 75,056 (Dec. 29, 2003).

³⁰¹ *Id.*

Well established tools such as the Greenhouse Gas Protocol exist to aid in the calculation of greenhouse gas emissions.

Factors to Evaluate in Assessing the Materiality of Climate Risks

While disclosure obligations will depend upon individual registrants' particular circumstances, and assessment of the materiality of climate risks, the following kinds of information should be considered and may be subject to disclosure obligations under existing Commission regulations.

Physical Risks Associated with Climate Change

A registrant should review and evaluate the consequences that physical risks and effects associated with climate change may have for the registrant's business and operations, including its personnel, physical assets, supply chain, and distribution chain, and must disclose information on those consequences when they are material to corporate performance.

Examples of such physical effects may include the impact of changes in weather patterns, such as increases in the storm intensity, sea-level rise, melting of permafrost, and temperature extremes, on facilities or operations; effects of climate change upon land, water availability or quality, or other natural resources on which the registrant's business depends; damage to facilities or decreased efficiency of equipment; or effects of changes in temperature on the health of the workforce.

For some registrants, financial risks associated with climate change may arise from physical risks to entities other than the registrant itself. For example, climate change-related physical changes and hazards to coastal property may pose a material credit risks for banks whose borrowers are located in at-risk areas. Climate change may also affect a registrant's supply chain in a variety of ways: climatic changes may diminish supplies of important inputs, physical damage to suppliers' infrastructure may cause costly interruptions in deliveries, and physical changes associated with climate change may decrease consumer demand for products or services. Registrants should evaluate whether they are subject to such risks and disclose any material information related to them. Physical impacts associated with climate change will vary widely depending upon companies' location and the nature of their facilities and operations, but

all registrants should review their exposure to such risks and, where the risks are material, must disclose them.

Financial Risks Associated with Greenhouse Gas Regulation

For many registrants, present or probable greenhouse gas regulation has material effects warranting disclosure. When compliance with any international, federal, state, or local laws and regulations concerning climate, including laws regulating greenhouse gas emissions, may have a material effect on the capital expenditures, earnings, and competitive position of the registrant and its subsidiaries, such laws should be identified and their effect discussed.

In conformity with Item 303 of Regulation S-K, registrants must describe any known trends or uncertainties in connection with the impact of climate change or greenhouse gas regulation that they reasonably expect will have a material favorable or unfavorable impact on net sales or revenues or income from continuing operations. When costs associated with compliance with such laws, or penalties for noncompliance, are material to a registrant's financial condition or operations, the registrant's disclosures must include an analysis of any such material effects, including a discussion of the financial risks and opportunities afforded by such regulations.

When a registrant concludes that legislative and regulatory proposals, although not yet enacted into law, are reasonably likely to be enacted and that such proposals, if adopted, would have a material effect on the company's financial condition or operations, the registrant should identify and discuss the proposals. The registrant should describe and evaluate realistic alternative regulatory scenarios.

Greenhouse gas regulation may have a material effect upon a registrant that is not itself directly subject to the regulation, for example by increasing the costs or decreasing the supply of some product or service on which the registrant's business depends, or increasing or decreasing demand for the registrant's products or services. Where material, such indirect effects should be identified and analyzed.

Legal Proceedings Relating to Climate Change

Under Item 103, registrants must describe any pending judicial or administrative proceeding other than routine business litigation, arising under any Federal, State or local laws, if the proceeding is considered material to the business or financial condition of the registrant; or involves a claim for damages exceeding 10 percent of the assets of the registrant and its subsidiaries on a consolidated basis; or a government authority is a party to such proceeding(s) and the proceeding(s) involves potential monetary sanctions above \$100,000. Registrants must disclose any proceedings arising under laws relating to climate change, including those regulating emissions of greenhouse gases, when the proceedings meet the Item 103 criteria.