Climate Change: The State We're In

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Timothy P. Fagan

Business and Legal Reports, Incorporated
141 Mill Rock Road East
Old Saybrook, CT 06475

INTRODUCTION

It is now generally accepted that global climate change is occurring and that human activities are a primary cause. While the United States government finally acknowledges these facts and the Supreme Court prepares to rule on EPA's responsibility to regulate carbon dioxide, little action has been taken at the federal level. As a result, state governments are beginning to step up and work together to implement state and regional programs to address greenhouse gas (GHG) emissions.

With California and states in the Northeast leading the way, steps are being taken to regulate GHG emissions and address what is potentially the most significant environmental issue of this and subsequent generations. What programs are being implemented in these and other states to monitor and control GHG emissions? Are the actions in California and the Northeast prompting other states to act? How might these changes impact the day-to-day operations at industrial facilities, and what are possible trends for the future?

What Is Climate Change?

The earth's weather and climate are created by energy from the sun, which heats the earth's surface, and in turn, the earth radiates energy back into space. Atmospheric GHGs trap some of the outgoing energy, retaining heat within the earth's atmosphere, similar to the glass panels of a greenhouse. GHGs include:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFC)
- Perfluorocarbons (PFC)
- Sulfur hexafluoride

The increasing concentration of GHGs in the atmosphere due to human activities, such as industrial development, fossil fuel combustion, and land development practices, is enhancing the heat-trapping capability of the earth's atmosphere, causing the average temperature to rise. The science of climate change is well documented in reports prepared by the Intergovernmental Panel on Climate Change (IPCC)[1], the National Oceanic and Atmospheric Administration (NOAA)[2], and the National Research Council (NRC)[3].

Why Is Climate Change a Problem?

The presence of GHGs is what maintains a comfortable average temperature on earth. However, the rising concentration of GHGs is causing rising temperatures, resulting in decreasing snow cover, an increase in sea level, and changing precipitation patterns[4]. Left unchecked, the future impacts of global warming are potentially far-reaching, adversely affecting human health, water resources, agriculture, and plant and animal life of various ecosystems. The IPCC has conducted and published an in-depth analysis of the potential impacts of climate change[5].

What Is Being Done to Address Climate Change?

International Actions

In 1997 in Kyoto, Japan, the attendee nations at the United Nations Framework Convention on Climate Change reached agreement on the Kyoto Protocol, a treaty that requires industrialized nations to reduce GHG emissions according to specific targets and timetables.

Federal Actions

Under the Bush administration, the United States has backed away from its support of the Kyoto Protocol, citing scientific and economic reasons, as well as the Protocol's failure to include developing nations, which have rapidly increasing emissions levels. In place of the Kyoto Protocol, the administration implemented its own Global Climate Change Policy in 2002, which aims to reduce GHG emissions without hindering economic growth by focusing on GHG intensity (i.e., the ratio of GHG emissions to economic output). The goal of the policy is to reduce GHG intensity by 18 percent by 2012. The administration opted not to mandate any actions that would reduce GHG emissions, but instead has chosen to achieve its goal entirely through numerous voluntary programs and partnerships.

However, a study released in May 2006 by the U.S. Climate Change Science Program and funded by the Bush Administration, confirmed the existence of climate change and the role of humans in contributing to the climate change problem, thereby eliminating much of the scientific uncertainty previously cited by the Bush Administration[6].

State Actions

Although the United States government finally acknowledges that global climate change is occurring and that human activities are a primary cause, little action has been taken at the federal level to ensure that GHG emissions are accounted for and controlled. As a result, many state governments are beginning to step up and work together to implement state and regional programs to address greenhouse gas emissions.

While some states continue to follow the lead of the federal government, many states, particularly those in the Northeast and on the West Coast, are taking steps to address climate change, such as more accurately quantifying GHG emissions through inventory development and mandated reporting, preparing climate action plans for identifying actions to reduce GHG emissions, implementing regulations to limit GHG emissions from motor vehicles, legislating the integration of renewable energy resources, and establishing regional cap-and-trade programs for GHG sources.

In addition, states continue to pressure the federal government to regulate GHG emissions by forcing EPA into a legal battle over the regulation of CO_2 that has led all the way to the U.S. Supreme Court.

Industry Actions

A number of large multinational corporations, which are facing pressure in the global arena to address climate change issues, have instituted their own GHG emissions reporting and management programs. They are, in turn, pressuring the United States to develop requirements on the federal level in order to avoid a patchwork of differing state regulations.

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Pressuring EPA

EPA has long argued that CO_2 is not considered a pollutant under the federal Clean Air Act, and even if it were considered a pollutant, it would be the Agency's discretion whether to establish regulations governing CO_2 emissions. In the case of *Massachusetts v. EPA* (2005), the U.S. Court of Appeals for the D.C. Circuit supported EPA's position that the Agency is not required to regulate GHG emissions from automobiles.[7] The case against EPA was brought by 12 states and other parties after EPA denied a petition to regulate CO_2 and other GHGs from new automobiles. As stated in the decision, the court supported the opinion that in addition to scientific evidence, EPA may also incorporate "policy" considerations when making decisions to regulate.[8] However, after being rejected by the lower courts, the states have appealed to the U.S. Supreme Court, which agreed to hear the case and is expected to hand down a decision in 2007.

GHG Inventories and Registries

GHG Inventories

The first step in addressing climate change and GHG emissions is to establish a baseline GHG emissions inventory, with 41 of the 50 states having some form of GHG inventory.

The majority of these states have established a baseline GHG inventory for 1990. However, from that point the frequency of data compilation varies, with many states compiling annual inventories while other states compiled inventories for only selected years. In addition, states also vary on the GHGs that are included in the inventory. Many states inventory all six of the aforementioned GHGs; other states have chosen to inventory only CO_2, CH_4, and N_2O.

GHG Registries

Voluntary reporting of GHG emissions has been encouraged for some time through the national emissions registry maintained by the U.S. Department of Energy. However, as states are considering regulating GHG emissions, it is becoming necessary to establish individual state and regional GHG registries to track the effectiveness of regulatory requirements and accurately manage regional programs. A GHG registry offers a source an opportunity to establish a baseline GHG emissions level, document any reductions in emissions, and possibly receive credit for such reductions if or when mandatory GHG limitations go into effect.

The California Climate Action Registry is a voluntary registry that requires the reporting of only CO_2 emissions for the first 3 years, but after the third year, participants must report all six GHG gases. New Hampshire, Wisconsin, and Georgia also maintain various types of voluntary registries.

In 2003, ten northeast and mid-Atlantic states (Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont), in cooperation with Northeast States for Coordinated Air Use Management (NESCAUM), formed the multistate Eastern Climate Registry. In 2005, the Lake Michigan Air Directors Consortium (LADCO), composed of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, received a grant to develop a similar GHG registry for the Midwest.

The Eastern and Midwest Climate Registries support voluntary and mandatory GHG emissions reporting from the participating states and ensure that consistent reporting and accounting practices are used regardless of differences in the various climate change policies and programs[9]. Such consistency will allow for interaction within the registries and with other registries, such as the California Climate Action Registry. The establishment of regional registries is necessary for the implementation of any regional program, such as a cap-and-trade program, which will necessitate mandatory reporting and detailed accounting of emissions.

At this point, most states encourage voluntary GHG registration. However, more aggressive states are requiring certain sources to report GHG emissions. Massachusetts, Connecticut, Maine, Wisconsin, and New Jersey all require mandatory reporting of GHG emissions in some form. Other states, including California and Arizona, are considering the implementation of mandatory reporting.

Climate Action Plans

Climate Action Plans (CAPs) are prepared by states to identify actions and programs that can be implemented to reduce GHG emissions. The depth of analysis and degree of implementation varies greatly from state to state, with 25 of the 50 states having already developed some type of CAP, and 6 additional states expected to complete their CAP by March, 2008.

Many states developed CAPs in the late 1990s in response to then President Clinton's 1993 Climate Action Plan[10]. The majority of these plans simply include a list of potential actions to reduce GHG emissions if such reductions become mandatory. As a result, very little progress has been made implementing the actions cited in these plans, although several of these states have recently taken action to update these existing plans or initiate the development of new CAPs.

In general, states that have developed CAPs within the last 5 to 7 years, many as a result of statutory requirement or executive order, are moving ahead with implementation of the plan rather than waiting for mandatory action to be imposed. Typically, plans contain such actions as renewable energy portfolios, energy efficiency requirements, GHG offset requirements, cap-and-trade programs, and reforestation.

The depth of analysis differs considerably from state to state. Aggressive states, such as Maine, Connecticut, and Arizona, identify actions in various sectors (transportation, energy, etc.), provide expected GHG reductions for each action, estimate the net cost of each action, and

prioritize the actions within sector. Less aggressive states simply provide a list of potential actions within each sector.

GHG Reduction Targets

In an effort to demonstrate their commitment to addressing climate change and provide an impetus to act on the implementation of activities to reduce emissions, several states have established definitive GHG reduction goals.

State/Area	GHG Reduction Targets		
New England States[11]	2010: 1990 levels	2020: 10% below 1990 levels	Long term: 75%-85% below current levels
New York	2010: 5% below 1990 levels	2020: 10% below 1990 levels	--
New Jersey	2020: 1990 levels	2050: 80% below 2006 levels	--
Delaware	2010: 7% below 1990 levels	--	--
Illinois	2020: 1990 levels	2050: 60% below 1990 levels	--
Arizona	2020: 2000 levels	2040: 50% below 2000 levels	--
California	2010: 2000 levels	2020: 1990 levels	2050: 80% below 1990 levels
New Mexico	2012: 2000 levels	2020: 10% below 2000 levels	2050: 75% below 2000 levels
Oregon	2010: stabilize emissions	2020: 10% below 1990 levels	2050: 75% below 1990 levels
Washington	2020: 1990 levels	2035: 25% below 1990 levels	2050: 50% below 1990 levels

Emissions Caps

Regional Greenhouse Gas Initiative (RGGI)

RGGI is a cooperative effort by northeast and mid-Atlantic states to reduce GHG emissions through the development and implementation of a regional CO_2 cap-and-trade program for power plants. The model rule has been developed and forms the basis of individual state regulations to implement the program.

The first compliance period is scheduled to begin January 1, 2009. The program seeks to maintain CO_2 emissions at 1990 levels from 2009 through 2014. The cap will then be ratcheted down through 2018, until it reaches 10% below 1990 levels by 2019. The cap is set over the entire RGGI region, and states will be allocated emissions budgets that will be distributed to applicable sources.

Participants include Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, and Vermont. Maryland joins in 2007, and Rhode Island has pledged to join as well.

State Caps

Massachusetts was the first state to regulate CO_2 emissions by establishing a cap-and-trade program for several of the state's older power plants. New Hampshire has established a similar regulation.

The California Global Warming Solutions Act of 2006 calls for the adoption of a statewide cap on GHG emissions in order to meet the state's reduction target of 1990 levels by 2020. By 2008, the California Air Resources Board (CARB) must verify the 1990 baseline emissions, establish a cap for 2020, and adopt mandatory GHG reporting for significant sources. The method of compliance with the cap, either source-specific regulation or a cap-and-trade program, must be determined by 2009, and final regulations must be adopted and implemented by 2011.

West Coast Governor's Global Warming Initiative

In 2003, California, Oregon, and Washington established the West Coast Governor's Global Warming Initiative and committed to implement programs within each state and regionally to reduce GHG emissions below current levels. The initiative resulted in 36 initial recommendations, many of which are now being implemented, and additional items that should be considered for the future, including a regional cap-and-trade program.

Other Significant Actions

Renewable Energy Portfolios

A renewable energy portfolio is a commitment to diversify the resources used to provide energy by using renewable resources, such as wind, solar, biomass, geothermal, hydropower, ocean thermal and tidal current, and landfill gas, to fulfill a certain percentage of the energy supply.

As improvements in technology are making renewable energy sources more viable and reliable options, states are passing legislation and implementing regulations to create a base for the use of renewable energy resources and offering financial incentives for further development. Currently, 23 of 50 states have renewable energy portfolio standards. Of those states, the standards vary greatly from Massachusetts's requirement that 4% of the energy provided by each utility be from renewable resources by 2009, to California, which requires 20% of power generation by 2017 to be from renewable resources but is hoping to hit that threshold by 2010 and get to 33% renewable energy by 2020.

Tailpipe GHG standards

Motor vehicles remain one of the largest sources of GHG emissions. California has aggressively targeted this sector by promulgating regulations in 2004, limiting GHG emissions from 2009 model year and later vehicles.

California is recognized as the national leader in regulating mobile sources. As such, many states throughout the country have chosen to adopt California motor vehicle standards and are continuing to follow California's lead by adopting the state's tailpipe GHG standards. Currently, 11 of 50 states have adopted the standards.

SUMMARY

Although the issue of climate change and how to address it is gaining momentum, it is the states rather than the federal government that appear to be the driving force behind the tracking and control of GHG emissions. The states are challenging the federal government to regulate CO_2 and have taken the fight to the highest Court in the land. The states are demonstrating a commitment to controlling GHG emissions by establishing reduction targets and utilizing

statutes, regulations, and executive orders to implement GHG reduction programs. The states are beginning to mandate the reporting of GHG emissions and are forming regional registries to support control programs. The states developed action plans to reduce emissions, and even in states that are not actively implementing the plans, a foundation exists that can be implemented at any time or when required. The states are mandating the integration of renewable energy resources, vehicle GHG emissions standards, and establishing GHG caps.

As the states move forward in addressing climate change, it is California and the northeastern states that are leading the way. Programs conceived and implemented in these areas, such as vehicle GHG emissions standards, required GHG reporting, regional registries, and cap-and-trade, are being considered and/or implemented in other states and regions throughout the country.

The proliferation of GHG emissions monitoring and control programs may force industry to monitor, quantify, control, and report GHG as they would any other regulated pollutant. Companies will place increased emphasis on energy and operational efficiency to limit GHG emissions from industrial facilities and from the transportation of goods.

As states proceed in regulating GHGs individually and regionally, industry will face the difficulty of dealing with different and inconsistent programs in various areas of the country. This issue, combined with the continuing development of regional registries that are able to interact with one another, may indicate a trend toward a nationwide regulatory program at some point in the future.

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