COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
U.S. HOUSE OF REPRESENATIVES

HEARING CHARTER

How Do We Know What We Are Emitting? Monitoring, Reporting and Verifying Greenhouse Gas Emissions

Tuesday, February 24, 2009
10:00 a.m. to 12:00 p.m.
2318 Rayburn House Office Building

Purpose

On February 24, 2009, the House Committee on Science and Technology, Subcommittee on Energy and Environment will hold a hearing entitled ***"How Do We Know What We Are Emitting? Monitoring, Reporting and Verifying Greenhouse Gas Emissions."*** The purpose of the hearing is to determine the federal role in supporting research and development of monitoring technologies, emissions factors, models, and other tools necessary to support reliable accounting of baseline greenhouse gas emissions and changes in emissions relative to the baseline under a regulatory program for greenhouse gases.

The Subcommittee will receive testimony on the procedures and methods used to monitor, report, and verify greenhouse gas (GHG) emissions from businesses, government agencies, and localities and to identify the challenges associated with accounting for emissions associated with different activities. The Subcommittee will also receive testimony on whether opportunities exist to improve the technologies, models, or other methods used to track greenhouse gases.

Witnesses

- **Mr. John Stephenson**, *Director, Natural Resources and Environment, Government Accountability Office.* Mr. Stephenson will discuss the systems designed to track greenhouse gas emissions from businesses and government agencies and the strengths and limitations of the information provided by existing greenhouse gas emission registries and the use of this information in a GHG regulatory system.

- **Ms. Jill Gravender**, *Vice President for Policy, The Climate Registry*. The Climate Registry is a nonprofit organization that establishes standards for businesses and governments to calculate, verify, and publicly report greenhouse gas emissions into a single registry. Ms. Gravender will discuss the general approach The Climate Registry has taken to develop protocols that both bring consistency to emissions reporting and provide assurance that the values reported by members are robust.

- **Ms. Leslie Wong**, *Director of Greenhouse Gas Programs, Waste Management, Inc*. Ms. Wong will discuss Waste Management's efforts to develop a corporate-wide greenhouse gas emission inventory and the company's participation in the California Climate Action Registry, the Western Climate Initiative, and the Chicago Climate Exchange.

- **Mr. Rob Ellis**, *Greenhouse Gas Program Manager, Advanced Waste Management Systems, Inc.* Mr. Ellis will discuss Advanced Waste Management Systems' role in verifying the information reported to greenhouse gas registries, such as The Climate Registry.

Background

In order to develop a framework to address greenhouse gas (GHG) emissions, it is essential to have a credible system for monitoring, reporting, and verifying GHG emissions. Accurate accounting of emissions is used to project changes in the concentration of GHGs in the atmosphere (inventories) and to determine emission contributions from specific sources (registries). Inventories of GHGs provide information about the net emissions within political or geographic boundaries (states, nations or continents) or within economic sectors containing many individual entities (e.g. transportation, manufacturing, power generation). GHG registries provide information about the emissions from specific entities within sectors (e.g. individual companies, towns, or universities) or the emissions associated with specific projects (e.g. under the Clean Development Mechanism of the Kyoto Protocol). This hearing will concentrate on information reported to GHG registries.

Measurement, reporting and verification are the backbone of a cap-and-trade or any other GHG control scheme. In a cap and trade system, permits to emit GHG's are considered commodities and their price is established by trading these commodities on the GHG market. Incorrect emissions data can undermine a program's legitimacy and effectiveness. Also, determination of the baseline emissions is essential to defining the emissions cap and to allocating allowances under a cap and trade system. A successful market-based GHG control scheme will need a fair, robust, and accurate monitoring, reporting and verifying system, thereby ensuring that emissions reductions have, in fact, occurred.

Measuring Greenhouse Gas Emissions

Greenhouse gas emissions can be quantified by measuring emissions of greenhouse gases[1] directly or by estimating emissions using other information such as fossil fuel combustion. Estimation is used more often than direct measurement and is the principle means used to support the European Union's Emissions Trading Scheme (ETS). Emissions are calculated by multiplying measurable activities such as fuel usage, with an emissions factor which is a numerical constant that links estimated emissions to a measurable activity that causes the emissions to occur[2].

[1] The six greenhouse gases are: Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).
[2] Office of Policy and International Affairs, United States Department of Energy. *Technical Guidelines: Voluntary Reporting of Greenhouse Gases (1605(b)) Program*. January 2007.

Emissions levels may also be quantified through mass balance calculations. For example, if two kilograms of the greenhouse gas HFC-134a was injected into an automobile air conditioner and years later the remaining kilogram is removed, then one can assume that the other kilogram was emitted into the atmosphere[3].

Emissions can be directly measured. On type of measurement device is a continuous emissions monitor (CEM). CEMs are rare in the European Union, but in the United States they are used to monitor carbon dioxide (CO_2), sulfur and nitrogen oxide emissions for entities regulated under the acid rain program of Title IV of the Clean Air Act. CEMs continuously monitor the flue gas emitted from coal, oil, and natural gas power generating units (over 25 MW) and some large manufacturing facilities. While the Clean Air Act does not currently regulate CO_2, the reporting provision has given utilities and other combustion sources experience in monitoring CO_2 emissions and a baseline of information on CO_2 emissions.

Reporting Greenhouse Gas Emissions

The information provided by different registries varies with respect to the gases monitored, the time period for reporting, the specific reporting protocols, and the data verification required of participants in the registry. For each registry the goal is to ensure that all entities are able to produce consistent and robust emissions data that will enable comparisons to be made from one reporting period to the next.

In the United States, there are several GHG registries that support reporting requirements for state and regional programs. At the federal level, there are currently two voluntary reporting programs, The Environmental Protection Agency's (EPA's) Climate Leaders Program and the Department of Energy's Voluntary Reporting of Greenhouse Gases Program or the 1605(b) program. EPA is expected to issue a notice of proposed rule making for a mandatory GHG reporting program very soon.

Over the past few years, states and regions have established policies to qualify and control GHGs. The California Climate Action Registry (CCAR) tracks emissions associated with specific entities and activities in California, and The Climate Registry compiles information on annual emissions from each member of the registry. Participation in The Climate Registry is voluntary, and The Registry has members throughout North America. The Chicago Climate Exchange (CCX) a GHG emissions trading market also provides a framework for reporting emissions from entities participating in the Exchange to its registry.

Verifying Greenhouse Gas Emissions

In order to ensure consistency and quality of reported emissions information, a GHG registry will often require third party verification of the reported emissions. During a verification audit, the verifier will check that the proper procedures, emissions inputs, use of emissions factors, etc. adhere to the registry's guidelines.

[3] Office of Policy and International Affairs, United States Department of Energy. *Technical Guidelines: Voluntary Reporting of Greenhouse Gases (1605(b)) Program*. January 2007.

Verifiers themselves are accredited by the American National Standards Institute (ANSI). ANSI evaluates verifiers by assessing whether they have the technical expertise to perform verifications, are knowledgeable about monitoring, reporting and verification protocols, including the international standard (ISO 14065) and the protocols of the specific registries they will work with.