



THE CARBON SEQUESTRATION NEWSLETTER

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Sequestration in the News

- **Technology roadmap.** The Carbon Sequestration Technology Roadmap has been posted on the NETL website, <http://www.netl.doe.gov/>. The roadmap defines technology goals and a timeline for the next ten years for the five areas: Separation and Capture, Geologic, Terrestrial, Ocean, and Novel Sequestration Systems.
- **Voluntary commitment to cut CO₂ emissions.** PSEG Fossil and the NJ Department of Environmental Protection announced a voluntary agreement to **reduce CO₂ emissions** by 15% below 1990 levels by 2005 at in-state power plants. In terms of CO₂, this is a reduction from a 1990 baseline of 1,706 pounds per MWh to 1,450 pounds per MWh. PSEG also committed \$1.5 million to NJDEP to assist in developing landfill gas projects, and will implement a \$300 million, ten year program to **reduce NO_x, SO_x and mercury** at its NJ coal-fired generating stations. *Financial Times*, January 24, 2002.
- **Ocean fertilization debate.** Two researchers from the University of California Santa Cruz and Lawrence Livermore National Lab wrote a letter to *Science* in support of researching carbon sequestration in the ocean. "The potential of the oceans as a repository should not be ignored," they said, and recommended ways to counteract acidification which should be explored. *Science Magazine*, January 11, 2002.
- **Alternate climate scenario.** A new report highlights data that show the growth rate of climate forcing by GHG emissions slowing over the past decade, because of concerted efforts by governments around the world. According to this new study, an "alternate scenario" might provide guidance for successfully curtailing climate altering factors without requiring unreasonable demands of both industrialized and developing countries. See "**An Alternate Scenario for Climate Change**," *NASA Goddard Institute for Space Studies*, January 14, 2002, and "**Limiting Methane Soot Could Quickly Curb Global Warming**." For the original paper by Hansen and Sato, see "**Trends of Measured Climate Forcing Agents**," *Proceedings of the National Academy of Sciences*, December 18, 2001.
- **Carbon regulation uncertainty.** The debate in Congress over multi-pollutant legislation conveys a larger context of uncertainty of the regulatory future in electric utilities. This period of possible modification has given rise to intense speculation on a number of fronts. An article on Jefford's bill S556 portrays some of them. "**Will the U.S. regulate CO₂ from power plants, giving a massive lift to the fledgling market in the trade of greenhouse gas emissions?**" *Eyeforenergy*, January 17, 2002.

This newsletter is produced by the National Energy Technology Laboratory and presents summaries of significant events related to carbon sequestration that have taken place over the past month.

Sequestration in the News, Continued

- **Iron ocean effect.** Did algal blooms help to magnify cooling of the atmosphere by sinking CO₂ into the ocean, and were the blooms caused by a sudden increase of dissolved iron in the water? Seven MBARI researchers left for New Zealand at the end of December to gather data to help answer this question. [The Southern Ocean Iron Experiment \(SOFeX\)](#) results will contribute to our understanding of biogeochemical processes of the global carbon cycle. This study is separate from the Australian-led expedition also in the Southern Ocean, featured in last month's newsletter.
- **Ocean's internal nutrient distribution.** Two researchers at Indiana University suggest that the amount of iron delivered during the ice ages was ten times the amount that could possibly be blown in by dust. Therefore, the fertilization was caused by internal systems of upwelling. "[Study Challenges Idea of Seeding Oceans With Iron to Curb Global Warming](#)," *National Geographic News*, January 8, 2002.
- **Meteorological data.** Last year had the second warmest global surface temperatures in more than 100 years, according to an analysis by James Hansen and other scientists at NASA. Global warmth in 2001 is particularly notable because it occurred at a phase of the southern oscillation in which the tropical Pacific Ocean is cool. *Science Magazine*, January 11, 2002.
- **EPA climate research.** The EPA Global Change Research Program gave a [presentation](#) to the 13th Symposium on Global Change Studies, January 14, 2002.
- **International cooperation.** The United States and Italy have agreed to cooperate on more than 20 research projects to investigate climate change. The projects include research in the areas of global and regional climate modeling, atmospheric studies, carbon cycle research, and low-carbon technologies. See "[US, Italy Agree to Climate Change Research Projects](#)," *Space Daily*, January 23, 2002. NETL is working with Italy on carbon sequestration research with the IEA GHG Programme and the CO₂ Capture Project.
- **Paleoclimatic influences.** Evidence suggests that a huge explosion of methane gas, released from beneath the sea floor, heated the Earth by up to 13 °F (7 °C) 55 million years ago. NASA scientists used data from a computer simulation to better understand the paleoclimatic influences. See "[Did Planetary 'Belch' Cause Prehistoric Warming?](#)," and "[Methane Explosion Warmed the Prehistoric Earth, Possible Again](#)," *NASA Goddard Space Flight Center*, December 10, 2001.
- **GHG emissions trading simulations.** CO2SIM will be conducting an on-line greenhouse gas emissions trading simulation on February 8, 2002. Participation in the simulation is free for non-government organizations, such as universities, environmental groups, and think tanks. Individuals who are interested in taking part in the simulation can find out more about CO2SIM and register for the simulation [on-line](#).

Events and Announcements

- **Coal bed and coal mine methane conference.** The Strategic Research Institute (SRI) will host a 2-day conference on coalbed and coal-mine methane March 25 and 26 in Denver, CO. The conference, "3rd Annual Coalbed and Coal Mine Methane Conference," will provide information on domestic and international case studies, financing strategies, regulatory developments, and technological improvements in coalbed and coal mine methane production. [Conference Calendar](#), March 2002.
- **The Spring North American Coalbed Methane Forum** is to be held in April 24, 25th.
- **Emissions trading conference.** Eyeforenergy is sponsoring [Emissions Trading 2002](#) on February 19 to 21 in Amsterdam.

Recent Publications

- **Deforestation and methane release.** Researchers at the Marine Biological Laboratory studying deforestation in Brazilian rainforests found that soil becomes much wetter when forest is converted to pasture (trees take up water from the soil). The water in the soil excludes oxygen; thus, more anaerobic decay and more methane production occur. So, not only does deforestation increase net CO₂ emissions, it also increases net methane emissions. Results would vary based on soil type and region. *NPR Earth and Sky* January 9, 2002.
- **Terrestrial sequestration research.** Thirteen articles in the journal *Environmental Pollution* report on research concerning terrestrial sequestration in forests, agriculture, and soil. A few interesting tidbits from the articles: most soils in the Midwest have lost 30 to 50 percent of their original pool, which can be resequenced through adoption of recommended soil and crop management practices; urban trees in the United States currently store approximately 700 million tonnes of carbon, with a gross carbon sequestration rate of 22.8 x10⁶ tC/yr; and semi-arid grasslands which had been grazed by livestock showed significantly higher soil carbon. *Environmental Pollution*, March, 2002.
- **Coal waste quandary.** The National Academies Press published the report “[Coal Waste Impoundments: Risks, Responses, and Alternatives](#),” which discusses IGCC technologies and the possible use of coal slurries as fuel. The report can be read online, January 2002.
- **Permitting paperwork.** A new report from Resources for the Future provides a set of recommendations for reforming permitting, including Chapter 5 of the Clean Air Act Amendments. See “[Reforming Permitting](#),” *Resources for the Future*, December 2001.
- **CO₂ capture paper.** Researchers from Argonne National Lab and NETL presented a paper “CO₂ capture from PC Boilers with O₂ Firing” at the 18th Annual International Pittsburgh Coal Conference December 4 to 7, 2001 in Australia. Email Sean Plasynski (plasynski@netl.doe.gov) for a copy of the paper.
- **Clean Development Mechanism meetings.** Information on the second meeting of the executive board of the CDM can be found at <http://unfccc.int/cdm/>. The meeting was held January 14 to 16, 2002 in Bonn, Germany.

Legislative Activity

- **4P Clean Power Act.** Senator Lieberman chaired the Environment and Public Works Committee as they discussed technology options and the feasibility of meeting the emissions goals of S556—Jim Jeffords’ four pollutant legislation. Testifying witnesses included the Acting Assistant Secretary for Fossil Energy, as well as representatives from both electrical utilities and technological manufacturers. Although Mr. Kripowicz stated that the Administration cannot support including reductions for CO₂ in S556, he said, “. . . carbon sequestration is one of the highest priorities of our program.” Senator Voinovich, who opened the hearing, announced that mark-up for S556 is scheduled for February 14. The [hearing](#) was held January 29, 2002.
- **Energy policy progress.** Majority Leader Tom Daschle announced plans to bring S1766, the Energy Policy Act of 2002, to the full Senate for consideration the week of February 11.
- **Future collaborations.** Senators John McCain and Joe Lieberman are working together to create a bill that would [propose a domestic cap-and-trade system](#) for GHGs. In the Environment and Public Works hearing on January 29th, Senator Lieberman stated that they are still working on the legislation, and will pay close attention to data from the Chicago Climate Exchange (CCX), which recently added Mexico City to their list of 45 participating entities.