



THE CARBON SEQUESTRATION NEWSLETTER

TABLE OF CONTENTS

December 2001

- Sequestration in the News
- Events and Announcements
- Recent Publications
- Legislative Activity

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Sequestration in the News

- **U.S. CO₂ emissions up in 2000** The Energy Information Administration recently released the Annual Energy Outlook 2002, which reports a CO₂ emissions increase of 3.1 percent in 2000, up from a 1.6 percent increase in 1999. Contributing to the large jump was a 4.7 percent increase in CO₂ emissions from electricity generation, as well as an 11 percent reduction in electricity generation from renewable fuels. Electric generators used a larger percentage of coal in 2000, partially in response to high natural gas prices. Reuters, [US carbon dioxide emissions up 3.1 pct in 2000](#), November 12, 2001.
- **Carbon sequestration public outreach** An article in the Financial Times spells out the options, challenges, and benefits of current carbon sequestration technology, research and development. Financial Times, [Down-to-earth plans for CO₂](#), November 9, 2001.
- **Ocean sequestration controversy** An article in the New York Times calls out some of the points in the debate over ocean carbon sequestration, citing a small-scale study at the Monterey Bay Aquarium Research Institute. New York Times, Science Section, [Plan Calls for Using Oceans to Soak up CO₂, Critics Cite Perils](#), November 20, 2001.
- **Postponing the proposal for power generation pollution regulations** The Environmental Protection Agency is unlikely to issue a proposal for multipollutant emissions reductions legislation from power plants by the end of the year, instead aiming for early next year. The article says that the administration vowed to oppose Jefford's four pollutant bill S556. Reuters, [EPA said to admit pollution rule unlikely this yr](#), November 12, 2001.
- **Climate sensitivity to solar forcings** Solar radiation goes through a cycle of brightening and dimming, which has been linked to changes in sea temperature and climate. Researchers at the Lamont Doherty Earth Observatory think the change in radiation is enough to trigger severe climate changes, such as the Little Ice Age. Using 12,000 years of data, the researchers were able to observe a very subtle 1,500 year pattern. The difference from the top of the cycle to the bottom is very small, less than 0.1 percent difference in energy levels. The researchers say that the sensitivity of climate to a weak force, such as subtle solar variability, should add urgency to the climate change debate, which is driven by concern that GHG forcings could have a severe climatic response. MSNBC, [Sea warmth has been linked to solar cycles](#), November 15, 2001

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

- **The permanence of terrestrial sequestration questioned** Forests and oceans exchange carbon with the atmosphere in fluxes varying from year to year. Net carbon exchange between the atmosphere and terrestrial systems was largely neutral in the 1980s, but in the 1990s terrestrial uptake of carbon was high, due in part to land use changes. A team of 13 researchers from around the world conclude that the rate of terrestrial carbon uptake will probably plateau in the future, no longer providing a buffer for increasing atmospheric concentrations. Saturation of CO₂ and N fertilization, maturation of second growth forests, and the global ecological effects of climate change could decrease or eliminate carbon sinks. *Nature*, *Recent patterns and mechanism of carbon exchange by terrestrial ecosystems*, November 8, 2001.
- **Turning treaties into law** Two weeks of negotiations in Marrakesh have produced a detailed rulebook governing the 1997 Kyoto Treaty. A major debating point in the negotiations was the amount of sink credits a country can receive. Russia, which had been charted for 17 million tons of terrestrial sequestration credits at the Bonn negotiations, bargained for and received an increase to 33. Kyoto will come into force when it is ratified by the governments of at least 55 countries representing 55% of 1990 global anthropogenic CO₂ emissions. *Reuters*, November 12, 2001.
- **Proceedings and text from Marrakesh** The Marrakesh Accords and full text of the COP-7 decisions are available online from the UNFCCC secretariat website, <http://www.unfccc.int>.
- **Cautionary approval for a European trading plan** The European Union approved a voluntary British pollution trading plan, but may seek changes before a mandatory European trading scheme is launched in 2005. *Reuters*, *EU approves UK pollution trading, may seek changes*, November 29, 2001.
- **Expanding the voluntary carbon market** Chicago and Mexico City have joined the Chicago Climate Exchange, a trading scheme based on voluntary GHG limits. The creation of a market for carbon emissions would help reveal the price of cutting carbon emissions. The Exchange is currently in its design phase, and includes 36 participating entities, including BP, Cinergy Corp, DuPont, Ford Motor Company, PG&E, and the Nature Conservancy. *EyeForEnergy.com*, *Chicago, Mexico City Attack Global Warming, Join Carbon Trading Exchange*, November 15, 2001.
- **Renting a positive terrestrial carbon flow** Assessing the permanence of terrestrial carbon sequestration is not necessary if the offsets are rented, says Roger Sedjo of Resources for the Future. In a presentation at RFF, he outlined the key advantages of renting carbon offsets, in comparison to other proposals such as the ton per year approach, which allots credits in proportion to the time period over which carbon is sequestered, or an approach which provides reasonable assurance of indefinite sequestration, which also provides partial credits according to the perceived risk that they will be temporary. To address possible impermanence of terrestrial sinks, Dr. Sedjo proposes structuring the transaction as a temporary lease, where a CO₂ emitter makes payments based upon the volume and duration of carbon uptake. The presentation draws on a paper by Dr. Sedjo. *RFF*, November 28, 2001.

Events and Announcements

- **FY2002 Broad Based Program Solicitation for Financial Assistance Applications (BBFA)** Entitled "Development of Technologies and Capability for Developing Coal, Oil and Gas Energy Resources," DE-PS26-02NT41422, the solicitation seeks applications for energy research and development. Area of Interest 4 DE-PS26-02NT41422-04 is Carbon Sequestration. The solicitation was issued through DOE's [Industry Interactive Procurement System](#) on November 15, 2001, and pre application materials are due December 6, 2001.

Events and Announcements, Continued

- **Concerted Action on Tradeable Emissions Permits (CATEP) Workshop** The core objective of the workshop is to provide insights into the likely economic and environmental effectiveness of various trading systems as a means to comply with the Kyoto Protocol. [Trading Scales: Linking Industry, Local/Regional, National and International Emissions Trading Schemes](#), Venice, Italy December 3rd - 4th, 2001.

Recent Publications

Proceedings from the regional terrestrial workshop The November 6-7, 2001 workshop, [Regional Partnerships in Terrestrial Carbon Sequestration: A "Hands-On" Workshop for the Appalachian Coal & Electric Utilities Industries](#), was sponsored by DOE, NETL and The DOE Center for Research on Enhancing Carbon Sequestration in Terrestrial Ecosystems (CSITE) in Lexington, KY. The purpose of the workshop was to bring the coal and utility industries together with government, academia, and other organizations to discuss offsetting CO₂ emissions by storing carbon in vegetation and soils of degraded lands. The proceedings can be downloaded.

The EPA multipollutant legislation analyses The Environmental Protection Agency Office of Air and Radiation posted three papers on their website pertaining to proposed limitations of GHG and pollution emissions from power plants. They are: ["Analysis of Multi-Emissions Proposals for the U.S. Electricity Sector"](#), ["Economic Analysis of a Multi-Emissions Strategy"](#) (requested by Senator Jeffords), and ["Comparison of the Jeffords-Lieberman and Smith-Voinovich-Brownback Bills."](#) EPA predicts that caps on SO_x, NO_x, mercury and CO₂ will cause a 30 to 50% increase in electricity prices and massive fuel switching, but no major change to GDP. October 31, 2001.

Energy research is a good investment The National Research Council of the National Academies Press released an analysis of energy research at DOE. Looking back as far as 1978, the report examines 17 R&D programs in energy efficiency and 22 programs in fossil energy funded by the DOE. These programs yielded economic returns of an estimated \$40 billion from an investment of \$13 billion. Large environmental gains were identified chiefly in the fossil energy arena, where two technologies - atmospheric fluidized bed combustion, and nitrogen oxides control resulted in more than \$60 billion in avoided damage and mitigation costs. Carbon sequestration is mentioned in Appendix E: Case Studies for the Energy Efficiency Program. The committee found that market incentives, such as new standards and regulations, can be useful for helping programs achieve success. [Energy Research at DOE: Was it Worth It?](#) July 2001.

Legislative Activity

Clean Air Act Amendments: multipollutant bill hearing The Committee on Environment and Public Works conducted [another hearing on S556](#) two weeks after the last hearing, which covered the EIA and EPA analyses. Senators from several western and Midwestern states feel the bill ignores regional situations and solutions. Several witnesses from utility companies expressed approval for a policy which is consistent across the US, and stated that such a policy could counteract fuel switching behavior by sending a strong signal to the market to develop gasification and other technologies, instead of a patchwork of state-wide policies. Chairman Jeffords informed the Committee that the Administration plans to have a formal energy proposal out no later than January, and the Committee will plan on a mark-up of s556 by February. Despite the Administration's views opposing the regulation of carbon from power plants, Senator Jeffords is strongly committed to keeping CO₂ in the bill. November 15, 2001.