

THE CARBON SEQUESTRATION NEWSLETTER

<http://www.netl.doe.gov/coalpower/sequestration/>

January 2004

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Sequestration in the News

USA Today, "Administration eyes burying carbon dioxide"

Highlights AEP's geologic sequestration field test in West Virginia. "The project is being closely watched by the Bush administration, which is funding it, and by the power industry. Both see burying the gas, carbon dioxide, as a possible long-term solution to keeping gases from power plants out of the atmosphere." *USA Today*, 12/09/03 http://www.usatoday.com/news/washington/2003-12-08-carbondioxide-usat_x.htm

PRNews, Entergy First U.S. Utility to Buy Geologic Carbon Sequestration Credits

Article on Entergy's recent purchase of 100,000 tonnes of GHG emissions credits from Blue Source. Says Jim O'Brien of Entergy, "This is exactly the kind of project that Entergy looks to invest in with our Environmental Initiatives Fund monies. Credits from this emissions trade will be used to fulfill our voluntary CO₂ stabilization commitment made in May of 2001." *PR Newswire*, 12/18/03, http://biz.yahoo.com/prnews/031218/dath003_1.html

Wall Street Journal, "If an oak eats CO₂ in a forest, who gets emissions credit?"

In a front page article on the AEP terrestrial sequestration project in the Mississippi River Delta, the WSJ describes some of the questions coming up in the field: How do you count the CO₂? What species are best for local ecosystems and store carbon well? What about credit for pre-existing reforestation activities? The article also describes AEP's CCX goals (1 percent per year reduction), and the power industry consortium called PowerTree, which aims to plant six forest sinks in the area. *Wall Street Journal*, 12/10/03. No link available

Midland Reporter-Telegram, "Emerging focus on CO₂ sequestration could benefit Permian Basin,"

A carbon sequestration workshop was added to this year's CO₂ flood conference held in Midland TX. "There are concerns about CO₂ outflow," said Michael Moore, managing partner of Falcon Environmental Services, "We are one of the few, if not the only, industries that can make it a commodity." 12/15/03 http://www.mywesttexas.com/site/news.cfm?newsid=10660653&BRD=2288&PAG=461&dept_id=474107&rfi=6

Science's Editors Name Soil Carbon Research an Area to Watch.

Soil scientists have started to ask, and answer, ecological questions, according to the editors of *Science*. They say to look for more studies of how microbes contribute to GHGs and more accurate knowledge of soils' impact on climate change. "Breakthrough of the year: Areas to Watch in 2004," *Science*, December 19, 2003.

Lawrence Journal World, "Experiment in oil recovery begins in Kansas"

A 5-year test of CO₂ enhanced oil recovery was recently initiated in Russell, Kansas. A nearby ethanol plant is the source of the CO₂. The experiment is the first application of CO₂ enhanced oil recovery in Kansas.

LJWorld.com. 12/05/03 <http://www.ljworld.com/section/stateregional/story/154140> Also see *Topeka Capital Journal*, KS, http://www.cjonline.com/stories/120503/bus_petrol.shtml

Wired Magazine, "Where CO₂ Goes to Die"

Quick rundown and commentary on four sequestration methods: saline aquifers, deep coal seams, offshore seabed aquifers, and forests. 12/03 <http://www.wired.com/wired/archive/11.12/start.html?pg=7>

Announcements

Call for papers. Abstracts for the Third Annual Conference on Carbon Sequestration are due February 4, 2004. The conference will be held outside Washington, D.C. in Alexandria, VA from May 2-6, 2004, and covers all aspects of sequestration research, demonstration, and development. For further information, please visit <http://www.carbonsq.com>

NETL Solicitation: Development of Technologies and Capabilities for Coal Energy Resources

The solicitation calls out five Areas of Interests including environmental and water resources; increased utilization of the by-products from coal gasification; carbon sequestration (which has four separate subtopics: direct capture, indirect capture, mitigating, non-CO₂ GHGs, and MMV/Risk Assessment); power systems advanced research; coal fuels and hydrogen; and gasification. **Program Solicitation Due February 24, 2004, 8:00 pm. No. DE-PS26-04NT42023-0**, <http://www.netl.doe.gov/business/solicit/main.html#42023>

Sequestration in the News, Cont'd

NASA Research Solicitation is seeking proposals to "improve understanding of changes in the distribution and cycling of carbon among the active land, ocean, and atmospheric reservoirs." Research is requested in four topical areas: (1) studies to be conducted as part of the North American Carbon Program, (2) global carbon cycle modeling and analysis focusing on use of remote sensing data, (3) regional studies outside of North America that provide critical understanding of and offer to reduce major uncertainties about the global carbon cycle, and (4) carbon management. Letters of Intent Due: February 11, 2004 Proposals Due: April 7, 2004 Carbon Cycle Science NRA-04-OES-01, <http://www.spaceref.com/news/viewsr.html?pid=11345>

Science

Soot in Snow May Contribute Significantly to Global Warming. James E. Hansen, a researcher at NASA's Goddard Space Center, has studied the climate-warming effects of soot. "A soot content of only a few parts per billion (ppb) is needed to reduce snow albedo by 1%. Climate simulations show that this modest albedo effect would cause a global warming that is more than a quarter of the warming observed in the past century." Hansen also suggests that, in addition to being a major cause of global warming, soot may be partially responsible for the accelerated melting of ice that is usually attributed solely to global warming. "For any given soot amount, its destruction of ice is greatly magnified by positive feedbacks. Increased absorption of sunlight causes snow to "age" more rapidly, thus increasing the ice crystal size and causing more absorption of sunlight." "Soot worse for global warming than thought," *New Scientist*, UK, <http://www.newscientist.com>

Prehistoric Farming May Have Impacted Atmospheric GHGs. Analysis of air trapped in ice cores drilled from the Antarctic ice sheet show anomalous increases in carbon dioxide levels beginning 8,000 years ago -- just as crop lands began to replace previously forested regions across Asia and Europe. About 5,000 years ago, the ice cores reflect a similarly anomalous rise in methane levels, this time tied to increased emissions from flooded rice fields, as well as burgeoning numbers of livestock. These explanations, set forth by Bill Ruddiman of the University of Virginia at the fall meeting of the American Geophysical Union, could explain why the current trends of increasing CO₂ and methane concentrations in the atmosphere predate the industrial revolution. Further details appear in the December issue of the journal *Climatic Change*. "Man changed climate for 8,000 years?" CNN, December 10, 2003 <http://us.cnn.com/2003/TECH/science/12/10/prehistoric.climate.ap/index.html>. See also, "Climate change and civilization," *Economist*, <http://www.economist.com/science/>

Australian Bushfires Linked to Warming. Fires are natural to Australia's dry bush, roaring through parched undergrowth and into oil-filled eucalyptus trees, sparking infernos. Dr Kevin Tolhurst from Australia's newly-formed Bushfire Research Centre claims the trend is due to droughts and more frequent severe weather events caused by global climate change. Another factor is that increased CO₂ in the atmosphere enhances bush growth providing more fuel for the fire. Says Mr. Tolhurst, ". . . instead of talking about a one in a hundred year event, we'd be talking more likely one in fifty or one in thirty year events becoming much more the par for the course." "Severe bushfires linked to global warming," *ABC Online*, <http://www.abc.net.au/pm/content/2003/s1006755.htm>

Geology

Interactive Guide on the North Sea Utsira Formation Statoil carbon sequestration project, <http://www.guardian.co.uk/flash/0,5860,1040175,00.html>

Microseepage Measurements at the CO₂-enhanced oil recovery operation at Rangely, Colorado, USA. The methodology and results for measuring microseepage are discussed. Shallow and deep soil gas concentrations, and direct transport of CO₂ and CH₄ into the atmosphere were measured. *Applied Geochemistry*, Volume 18, Issue 12, December 2003, Pages 1825-1838

Capacity Estimate for CO₂ Storage in Saline Formations. Considering only the region where the injected CO₂ would be a dense fluid, the capacity of the Viking aquifer in Alberta Canada to sequester CO₂ in solution in the formation water is calculated to be 100 Gt. *Energy Conversion and Management*, Volume 44, Issue 20, December 2003, Pages 3151-3175

A New DOE Geologic Presentation. "U.S. DOE Field Efforts Sequestering CO₂ in Geologic Formations" [3 MB] describes the West Virginia, Texas, and New Mexico geologic field tests. It has been posted on the NETL website. December 12, 2003, http://www.netl.doe.gov/coalpower/sequestration/pubs/presentations/SPE_AAPG_090803.pdf

Technology

Landfill Gas Capture. Renovar Energy, a Texas-based company, plans to separate and recover methane from CO₂ and other landfill gases. "Devil's Swamp landfill gets new name, role," *Baton Rouge Advocate*, LA, http://www.2theadvocate.com/stories/122703/new_devil001.shtml

Synthetic Virus May Lead to Sequestration. Dr Craig Venter and researchers from the Institute for Biological Energy Alternatives have synthesized a virus with the potential to convert CO₂ to hydrocarbon fuels. They pieced together phi-174 from short, single strands of synthetically produced, commercially available DNA known as oligonucleotides. Enzymes were used to glue the oligonucleotides together to form and copy a 5,386-base genetic strand. "Synthetic virus '10 years away from battling pollution,'" *The Engineer*, December 5, 2003

Landfill Gas Capture. Renovar Energy, a Texas-based company, plans to separate and recover methane from CO₂ and other landfill gases. "Devil's Swamp landfill gets new name, role," *Baton Rouge Advocate*, LA, http://www.2theadvocate.com/stories/122703/new_devil001.shtml

Bioengineering Insufficient? This article describes the (above) biological carbon sequestration plan to find carbon-loving microbes in the sea, find the genes responsible for their carbon-munching ways, and transfer them to other microbes that can be cultured easily in bioreactors. The article also talks about terrestrial sequestration using forests, and changing agricultural practices by reducing tillage. "Carbon-Crunching Critters: Genetic engineering won't stop global warming," *Spectrum*, December 31, 2003, <http://www.spectrum.ieee.org/WEBONLY/publicfeature/jan04/0104bio2.html>

Ocean

Raman Spectrometer on the Ocean Floor. Article summarizes the studies and experiments being performed by MBARI in the Monterey Bay. "The emergence of Global Positioning Systems and remotely operated vehicles such as MBARI employs make the use of our instrumentation in extreme environments more and more feasible," says Jill Pasteris of MBARI. "Trapping Carbon Dioxide In An Icy Cage: Researchers explore the ocean floor with rare instrument," *Science Daily*, <http://www.sciencedaily.com/releases/2003/12/031231082637.htm>

Climate Influence of Ocean Salt Cycling. A comparison of salinities on a long transect through the western basins of the Atlantic Ocean between the 1950s and the 1990s finds systematic freshening at both poleward ends contrasted with large increases of salinity pervading the upper water column at low latitudes. Results extend a growing body of evidence indicating that shifts in the oceanic distribution of fresh and saline waters are occurring worldwide in ways that suggest links to global warming and possible changes in the hydrologic cycle of the Earth. "A change in the freshwater balance of the Atlantic Ocean over the past four decades," *Nature*, December 18, 2003, <http://www.nature.com> [type "freshwater balance" into the search field]

Ocean Upwelling Affected by Climate Change. Noah Diffenbaugh and others at the University of Santa Cruz predict through computer simulations that global warming-induced wind will change the intensity and the seasonal timing of coastal ocean upwelling along the California coast. http://www.ucsc.edu/news_events/press_releases/text.asp?pid=433

Terrestrial

Soil Carbon Modeling Web Site. Scientists at Purdue and Colorado State Universities developed prototype web-based tools to simulate how much carbon is stored in soil under different management regimes. The C-STORE model, a simplified version of the Century model accounts for different cropping, tillage, hydric conditions, and soil texture. A Web interface for the Indiana COMET database is available at <http://pasture.ecn.purdue.edu/~cstore/COMET>. The prototype version of the Web GIS based CSTORE is available at <http://danpatch.ecn.purdue.edu/~cstore/C-STORE/>.

Forestation Incentives from USDA. A part of the Conservation Reserve Program authorized by the 2002 Farm Bill provides eligible farmers \$50 a year or more per acre for as long as 15 years as incentive to reforest farmland. Nut and seed producing species, such as oaks, maple, ash and tupelo will be preferred to promote wildlife. Farmers may also eventually trade the value of their timber to industries for carbon credits. The initiative is targeted toward land within a 100-year flood plain adjacent to a permanent stream that has been farmed for four years of a six-year span ending in 2002. The land also must contain at least 51 percent hydric soils, which are representative of wetland areas. Farmers interested can contact the state Farm Service Agency office, (318) 473-7721. "Farmers urged to create forests; Program pays them to plant hardwoods," *The Times-Picayune* (New Orleans, LA), December 13, 2003

Climate Change Feedbacks in Northern High Latitudes. Scientists at NASA's Jet Propulsion Laboratory predict that increased carbon uptake from a longer growing season in Alaska and other northern regions may be overwhelmed by CO₂ released from thawing permafrost. "Frozen soil can store carbon for hundreds to thousands of years," said lead author Dr. Kyle McDonald of JPL, "but when the permafrost thaws and begins to dry out, it releases the carbon back into the atmosphere." "NASA scientists discover spring thaw makes a difference," *Innovations-Report*, http://www.innovations-report.com/html/reports/earth_sciences/report-24217.html

Urban Trees Reduce Energy Costs. Results from an hourly building energy simulation model show that ratepayers in the greater Toronto Area could realize annual energy savings of over \$11M from cool roofs, shade trees, wind shielding of trees, and ambient cooling by trees and reflective surfaces. Potential annual electricity savings are estimated at about 150 GWh and potential peak power avoidance at 250 MW. "Energy effects of heat-island reduction strategies in Toronto, Canada," *Energy*, Volume 29, Issue 2, February 2004, <http://www.sciencedirect.com/science/journal/03605442>

Trading

DOE Releases Proposed 1605(b) GHG Registry Guidelines. On November 26 the U.S. DOE released proposed revised guidelines for voluntary GHG emissions and reduction reporting. Other technical changes to registry reporting requirements are being developed and will be made available for review and comment at a later date. DOE invites written comments by February 3, 2004, and will host a public workshop on January 12, 2004, in Washington, DC, to discuss the proposal and receive oral comments. Written comments should be submitted to 1605bgeneralguidelines.comments@hq.doe.gov. <http://www.pi.energy.gov/enhancingGHGregistry/>.

AETF Review December/January issue (Australasian Emissions Trading Forum) The most recent issue reviews the UK emissions trading scheme (ETS) upon completion of its first year of operation. <http://www.aetf.net.au>

Chicago Climate Exchange New Members. London-based brokerage Traditional Financial Services (TFS) and IBM are the latest to join the CCX. IBM committed to reduce its GHG emissions by 4 percent below the average of its 1998-2001 baseline by 2006. "TFS joins the Chicago Climate Exchange," Point Carbon, December 9, <http://www.pointcarbon.com/article.php?articleID=2931&categoryID=147>, and "IBM joins Chicago Climate Exchange," December 11, <http://www.pointcarbon.com/article.php?articleID=2945&categoryID=147>

Policy

COP 9. The annual ministerial meeting of the 188 Parties to the United Nations Framework Convention on Climate Change was attended by more than 5,000 participants. An agreement on the modalities and scope for carbon-absorbing forest-management projects in the Clean Development Mechanism (see below) completes the Marrakesh issues of two years ago and expands the CDM to an additional area of activity. Two funds, the Special Climate Change Fund and the Least Developed Countries Fund were further developed. "Milan conference concludes as ministers call for urgent and coordinated action on climate change," December 12 2003, http://unfccc.int/press/prel2003/pressrel121203_1.pdf

Annex I Countries Allowed to Store One Percent of Annual GHG Emissions in CDM Forestry Projects. The rules agreed on at COP 9 stipulate that trees must be at least two metres tall, with canopies covering at least 10% of an area, and that cultural and religious sites are taken into account when deciding where to plant. The agreement does not rule out genetically modified plants or single species plantations. "Agreement on use of carbon sinks in CDM finalized," Environmental Data Interactive, UK, <http://www.edie.net/news/Archive/7859.cfm>

Deep Emissions Reductions Called for by German Advisory Council. In a report published November 25, the German Advisory Council on Global Change contends that the world can tolerate a rise of up to 2°C over pre-industrial levels. Beyond this, sudden phenomena such as abrupt disturbances to the North Atlantic Ocean's currents would negatively affect society. Global mean temperatures have increased by 0.6 °C since 1900, and may increase by a further 1.4–5.8 °C by 2100, according to the Intergovernmental Panel on Climate Change. The report concludes that global CO₂ emissions would need to be curbed by 45–60% by 2050 compared with 1990 levels to avoid severe societal impact. For the report, visit http://www.wbgu.de/wbgu_sn2003_presse_engl.html

Uncertainty and the Power Industry. This article discusses uncertainty and planning in the power industry, including the effects of potential legislation for mercury and carbon control. Bill Hall, executive vice president of Duke Power, said "The only viable technology seems to be carbon sequestration." According to the article, state policy-makers trying to address climate change concerns on a state level make planning and resource acquisition more uncertain, without a national level playing field. "Power Flux; Generators struggle to plan for the future as they cope with an unstable present," *Public Utilities Fortnightly*, December, 2003. No link available

Letter to the Editor from Dr. John Marburger. The Director of the Office on Science and Technology Policy wrote to the editor of *The New York Times* in response to an article on the Kyoto Protocol, offering evidence of U.S. leadership on climate issues. Investing billions of dollars in collaboration with developed and developing countries, mobilizing tens of billions of private-sector dollars, and investment in carbon sequestration, hydrogen fuel cycle technology and energy-related biotechnology are some examples. "Policy on Climate Change, Re 'Kyoto Protocol in Peril,'" December 11, 2003.

Editorial in the *Financial Times* by Paula Dobriansky. The US undersecretary of state for global affairs wrote that the open-ended path toward breakthrough, transformative technologies is favored by U.S. policy, while sharing the goals of the UNFCCC. Stabilization of GHG concentrations at a level that will prevent dangerous human interference with the climate through collaborative R&D on carbon sinks, the Future-Gen project, and the Carbon Sequestration Leadership Forum are preferable to targets-based policy, according to the article. "Only new technology can halt climate change," *Financial Times* (England), December 1, 2003.

Events

January 20 - 22, **EUEC 2004, Air Quality, Global Climate Change & Renewable Energy**, Tucson, Arizona. Multi-emission strategies and legislation, control technologies, emerging legislation, regulations, policies and creative solutions for CDM, carbon sequestration & trading. http://www.euec.com/registration/regonline_step1.asp

January 20-22, 2004, **Energy partner using soil carbon sequestration to offset GHGS**, College Station, TX. http://ageco.tamu.edu/faculty/mccarl/acs/CASMGS_CONF_send.HTM

January 29-30, 2004, **5th Annual Event: Emissions Trading, Analysing the National Allocation Plans and the Practical Implications of the EU Trading Scheme**, London, UK. Contact: Ms. Jacquelyne Muhati, Marcus Evans, jacquelynem@marcusevansuk.com, or visit <http://www.marcusevans.com>

February 8-11, 2004, **A GTI Conference & Exhibition, Natural Gas Technologies II**, Phoenix, AZ. Cosponsored by the U.S. Department of Energy's National Energy Technology Laboratory's Strategic Center for Natural Gas Methane emissions detection, GHG management and CO₂ sequestration technologies. Contact: paul.reneau@gastechnology.org

February 25-27, 2004, **The WestStart Clean Heavy-Duty Vehicle Conference**, Palm Springs, CA. Web site: <http://www.calstart.org/programs/chdvc/index.php?p=programs#>

March 23-24, 2004, **IQPC conference: European Emissions Trading 2004**, Brussels, Belgium. Contact: Mr Gareth Pearce, IQPC, Anchor House, 15-19 Britten Street, London SW3 3QL, UK, tel.: +44 20 7368 9333, fax: +44 20 7368 9303, <http://www.iqpc.co.uk>

March 15-16, 2004, **Climate Change in New England and Eastern Canada: Impacts and Adaptation Responses**, Boston, Massachusetts. Sponsored by the Conference of New England Governors and Eastern Canadian Premiers, the meeting will focus on the environmental and economic impacts of climate variability on natural resources in the northeast. <http://www.negc.org>.

March 28-April 1, 2004, **ACS Spring meeting**, Anaheim, CA. A special sequestration symposium, "Carbon Dioxide Capture and Sequestration". Contact: Mercedes Maroto-Valer mmm23@psu.edu or Dan Fauth Daniel.Fauth@netl.doe.gov. <http://oasys.acs.org>

Events

April 13-15, 2004, **15th Annual Earth Technologies Forum**, Washington, DC. Co-sponsored by the International Climate Change Partnership (ICCP), and the Alliance for Responsible Atmospheric Policy, and in cooperation with the U.S. EPA, the UNEP, the UNDP, U.S.DOE, U.S.AID, Environment Canada, Industry Canada, Japan Ministry of Economy, Trade and Industry, Australian Greenhouse Office, Netherlands' Reduction Plan for the Non-CO₂ GHGs, World Council for Sustainable Development, IETA, and over 90 endorsing associations and organizations. <http://www.earthforum.com>

April 18-21, 2004, **American Association of Petroleum Geologists meeting, CALL FOR PAPERS**, Dallas, TX. AAPG has asked for sessions on critical scientific results relevant to the subject of the potential for geological CO₂ sequestration to impact the fossil fuel economy. Contact Nicholas Woodward and Susan Hovorka, Co Chairs, nick.woodward@science.doe.gov and susan.hovorka@beg.utexas.edu, CO₂ Sequestration Sessions (DEG) <http://www.aapg.org/meetings/dallas04/index.html>

April 20-21, 2004, **Point Carbon: Carbon Market Insights 2004**, Amsterdam, the Netherlands. Contact: Mrs. Marte Nordseth, tel: +47 907 71 668, e-mail: conference@pointcarbon.com, <http://www.pointcarbon.com>

April 25-30 2004, **CALL FOR PAPERS, EGU – 1st General Assembly**, Nice/France. The BG 12 Regional greenhouse gas budget of the terrestrial biosphere session is addressed to researchers working on surface fluxes of direct and indirect greenhouse gases. The session will also focus atmosphere and ecosystem exchange processes, feed-backs and trade-offs, and implications for climate change mitigation measures in the terrestrial biosphere. Co-Sponsorship: CarboEurope Submission of abstracts: Deadline for Receipt of Abstracts: 11 January 2004. Please see http://www.copernicus.org/EGU/ga/egu04/abstract_submission.htm

May 2-6, 2004, **CALL FOR PAPERS: Third Annual Conference on Carbon Sequestration**, Alexandria, VA. Abstracts are due February 4, 2004. For further information, please visit <http://www.carbonsq.com>

May 5-7, 2004, **GHG Registries, Climate Policy and the Bottom Line**, San Diego, CA. Contact: Gwendy Donaker, California Climate Action Registry, tel.: +1(213)8916920, fax: +1(213) 6236716, e-mail: gwendy@climateregistry.org, Internet: www.climateregistry.org

May 10-14, 2004 **2nd World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection**, Rome, Italy, <http://www.conference-biomass.com/>

June 7-10, 2004, **Working for Clean Air in Clearwater**, Clearwater, FL. The U.S. EPA and the Emissions Inventory Improvement Program are co-sponsoring the 13th annual international symposium on emission inventories. The technical program committee is interested in applications of new technologies, including emissions related to climate change. <http://www.epa.gov/ttn/chief/conferences.html>.

September 5-9, 2004, Vancouver, Canada. GHGT-7 is being organized by University of Regina, Natural Resources Canada, and the IEA GHG R&D Programme. www.ghgt7.ca

November 2004, **Climate Change and Business**, Auckland, New Zealand. Seven partner organisations are putting together a conference on the business opportunities arising from climate change. For further information, see: <http://www.climateandbusiness.com/>

Recent Publications

AEO 2004: EIA Draft Preview. CO₂ emissions from energy use are projected to increase from 5,729 million metric tons in 2002 to 8,142 million metric tons in 2025 in AEO2004, an average annual increase of 1.5 percent. This is slightly less than the projected rate of increase over the same period in AEO2003, 1.6 percent per year. December 16, 2003 (Full Report Available January 2004) <http://www.eia.doe.gov/oiaf/aeo/>

The Potential Role of Transportation in GHG Reductions. The Transportation Research Board of the U.S. National Research Council released "Travel Matters: Mitigating Climate Change with Sustainable Surface Transportation," a report that examines potential GHG emissions reductions from transportation. The report's companion website allows individuals to calculate transportation-related emissions. http://gulliver.trb.org/news/blurb_detail.asp?id=2071

Japanese Government Draft Document on Post-2012 Regime. An interim draft report considers the climate regime beyond 2012. Released by the Global Environment Committee of Japan's Central Environment Council, of the Ministry of the Environment, <http://www.env.go.jp/en/topic/cc/031126.pdf> The Committee will accept comments submitted by January 16th to Naomi Inoue, E-mail: chikyu-ondanka@env.go.jp,

China and the Evolution of the Present Climate Regime. Analyzes whether the participation of China in the cooperative effort to control GHG emissions can provide adequate incentives for the US to move back to the Kyoto process FEEM Working Papers 103.2003, <http://www.feem.it/Feem/Pub/Publications/WPapers/default.htm>

Overview of the Carbon Market 2003. The World Bank PCFplus Research Program released its 2003 "State and Trends of the Carbon Market." Key findings include: Volume exchanged on the carbon market has doubled in 2003 compared with 2002, up to more than 70 million tonnes of CO₂e. The bulk of the volume is exchanged mostly for the purpose of compliance with the Kyoto Protocol. Most emission reduction projects are located in transition economies and developing countries, and the private sector represents more than 40% of the volume purchased. The report is based on material provided by Evolution Markets LLC, Natsource LLC and PointCarbon, and on direct interviews with market participants. <http://prototypecarbonfund.org/router.cfm?Page=Research>

Trading analysis of 2003. The International Emissions Trading Association (IETA) has published "Greenhouse gas Market 2003: Emerging but fragmented," with contributions from Point Carbon, Natsource, BP, PWC, CO₂e and many others. http://www.ieta.org/Documents/New_Documents/ggm_2003.pdf

Recent Publications

U.S. Technology and Innovation Policies: Lessons for Climate Change, Pew Center Report examines U.S. experience with technology and innovation policies and draws lessons for addressing the climate change issue. <http://ealert.pewclimate.org/ctt.asp?u=438171&l=12457>.

“Global Warning” The lead article in the December issue of *Audubon Magazine* addresses climate change. “. . . across the political spectrum, Republicans, Democrats, governors, senators, and industry leaders agree that climate change is for real and must be dealt with—*now*.” <http://magazine.audubon.org/>

New Analytical Tool and Interactive Database. The World Resources Institute launched the Climate Analysis Indicators Tool (CAIT) at COP-9. CAIT provides a comparable database of GHG emissions data (including all major sources and sinks). <http://cait.wri.org>. For more information, contact Kevin Baumert, World Resources Institute, kbaumert@wri.org, <http://www.wri.org/wri>

Legislative Activity

Ocean and Coastal Observation Systems Act. S.1400 is a bill to develop a system that provides for ocean and coastal observations, data and information required by all components of an integrated ocean observing system and related research. Sponsored by Senator Snowe, Olympia J. [ME], with 8 co-sponsors. Referred to House Committee after being received from Senate, 11/13/2003, <http://thomas.loc.gov/cgi-bin/bdquery/z?d108:s.01400>:

This newsletter is produced by the National Energy Technology Laboratory and presents summaries of significant recent events related to carbon sequestration. If you'd like to join the e-mail distribution list, email majordomo@list-manager.netl.doe.gov with "subscribe sequestration" in the body of the message. We encourage you to pass this along to interested persons. Contact: Scott Klara, klara@netl.doe.gov.