

THE CARBON SEQUESTRATION NEWSLETTER

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

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Sequestration in the News

Paula Dobriansky speaks on U.S. Climate Change Policy.

Dobriansky, Undersecretary for Global Affairs at the U.S. State Department, highlighted carbon sequestration and the Carbon Sequestration Leadership Forum in her remarks before the Federation of Austrian Industry in Vienna. "The United States remains fully committed to the United Nations Framework Convention on Climate Change and shares its ultimate objective of stabilizing greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate." Ms. Dobriansky cited three "fundamental pillars," of U.S. policy: increasing international collaboration, improving scientific understanding, and developing breakthrough technologies. Carbon sequestration was set forth as a promising breakthrough technology. March 3, 2004. <http://usinfo.state.gov/gi/Archive/2004/Mar/08-969909.html>

Australian Government Announces Research Effort into Advanced Coal Power with Sequestration.

The Australian federal government has launched the COAL21 National Action Plan -- a joint government/industry initiative on greenhouse gas reduction technologies. At the core of the COAL21 strategy is the aim of reducing the average emissions intensity target to 650kg of CO₂ per megawatt hour by 2030, from the present 1017kg. Achieving this would require the equivalent of about 20 percent of coal-based generation to produce zero emissions by 2030, through CO₂ capture and storage. The proposal is contentious within Australian politics as other groups would prefer GHG emissions mitigation money be spent on efficiency, renewables, and demand management. March 24, 2004. http://www.theaustralian.news.com.au/common/story_page/0,5744,9077771%255E30417,00.html The National Action Plan can be downloaded at: <http://www.coal21.com.au/>

Utility Tree Plantings Transition from Public Relations to Carbon Credits.

Article describes the goals and day-to-day operations of PowerTree and other terrestrial sequestration efforts being undertaken by U.S. Utility companies. Focus is turning to finding inexpensive land and verifying carbon uptake. *St. Louis Post-Dispatch*, www.stltoday.com/

Carbon Sequestration - Bridging the Gap between Kyoto and a Viable Global Carbon Management Programme?

Essay summarizes the global climate change issue and discusses carbon sequestration as a GHG emissions mitigation option. *Energy Pulse* http://www.energypulse.net/centers/article/article_print.cfm?a_id=633

Making Money Off Carbon Dioxide. Article highlights enhanced gas recovery operations at the K12-B field in the North Sea and the Weyburn project in Canada. *Iafrica.com* March 1, 2004 <http://cooltech.iafrica.com/features/303058.htm>

CO₂ Capture Welcome in Monroe, WI. A four-hundred-ton-per-day commercial CO₂ capture and marketing operation is being appended to an existing ethanol production facility in Monroe, Wisconsin. Local officials are pleased with the jobs it will bring. CO₂ capture also promises to lower the odors from the fermentation facility. *Monroe Times* March 10, 2004 <http://www.themonroetimes.com/o0310co2.htm>

Announcements

DOE Submits FutureGen Program Plan to Congress. 275 MW power plant with hydrogen production and CO₂ capture to begin operation in 2011. Plan offers a 26% non-Federal cost share. Read full plan at:

http://www.fossil.energy.gov/programs/powersystems/futuregen/futuregen_report_march_04.pdf

DOE Announces Eight Awards for Breakthrough Carbon Sequestration Research. The eight awards, totaling \$4.5MM of effort over three years (no cost share), were selected from a pool of over 100 proposals. The rewards result from a successful collaboration between DOE and the National Academies of Science aimed at bolstering the DOE Program's portfolio of high-risk / high-reward projects. March 5, 2004. DOE Techline at: <http://www.netl.doe.gov/coalpower/sequestration/index.html>

Science

Atmospheric CO₂ Accelerating. Average readings at the 11,141-foot Mauna Loa Observatory, where CO₂ density peaks each northern winter, hovered around 379 parts per million on Friday, compared with about 376 a year ago. That year-to-year increase of about 3 parts per million is considerably higher than the average annual increase of 1.8 parts per million over the past decade, and markedly more accelerated than the 1-part-per-million annual increase recorded a half-century ago, when observations were first made here. March 20, 2004. http://news.yahoo.com/news?tmpl=story2&cid=624&u=/ap/20040321/ap_on_sc/climate_record_co2_4&printer=1

Atmospheric CO₂ Correlated to Global Temperature Changes over Past 570 Million Years. "Reviewing the geologic records of CO₂ and glaciations, we found that CO₂ was low during periods of long-lived and widespread continental glaciations and high during other, warmer periods," says Dana L. Royer, research associate in geosciences at Penn State. "Previous suggestions that cosmic ray flux correlated better with ancient temperatures than carbon dioxide do not appear true. While cosmic ray flux may be of some climatic significance, it is likely of second-order importance on a multimillion year timescale." Researchers adjusted estimates for atmospheric CO₂ based on ocean water pH. <http://live.psu.edu/story/6011>

Antarctic Glacier Melting Much Faster Than Expected. Scientist on expedition in Antarctica found that the Brown Glacier is melting at a rate four times that which had been measured between 1950 and 2000. March 6, 2004 <http://www.abc.net.au/news/newsitems/s1060459.htm>

NASA's Improved Web-Resource on the World's Changing Climate. The website provides a wealth of information and current data related to global climate change. Site is designed to be useful to users ranging from climate scientists to elementary school teachers. NASA's Earth Observatory, March 1, 2004, <http://earthobservatory.nasa.gov/Newsroom/NasaNews/2004/2004030116590.html>

Geology

Beta Demonstration of the NatCarb Online Database Available NATCARB portal now pulls data in real time from Kansas, Illinois, Ohio, (Indiana soon), and USGS (EROS Datacenter). Please visit the NATCARB Portal Beta Site (<http://drysdale.kgs.ku.edu/natcarb/midflash/natcarb.html>) for a demonstration. A progress report in can be found at http://www.natcarb.org/Committee/NATCARB_Progress_Report.pdf

Technology

Lithium Zirconate Paper in Science describes how the CO₂ sorption properties lithium zirconate can be modified through doping. "The rate of the CO₂ sorption on pure lithium zirconate is controlled by the diffusion of CO₂ in the solid lithium carbonate shell. For potassium doped lithium zirconate or lithium yttrium-zirconate the rate limiting step for CO₂ sorption is shifted to diffusion of oxygen ions in the zirconia shell. <http://www.sciencedirect.com/science/article/B6THJ-48Y6WMR-3/1/3bc54d8dc31ed52512b97fe54e6a9329>

EU Steelmakers Push Toward Breakthrough Technology. A consortium European steelmakers and other organizations put forward to the European Commission a research project to develop Ultra Low CO₂ Steelmaking (ULCOS) technologies. These reportedly include the capture and sequestration of vented CO₂. "Corus Involved in Breakthrough CO₂ Reduction Technology," *PR Newswire European*, March 12, 2004

Terrestrial

Exotic Trees Shown to Grow on Coal Mine Spoil Land. On the basis of biomass and primary productivity, Eucalyptus hybrid and Acacia auriculiformis were found suitable for plantation on coal mine spoil land. <http://www.sciencedirect.com/science/article/B6VFB-4BRP6N7-2/1/edd39eed2eecb363afa466ee0a1c0c99> Paper published in *Ecological Engineering*, Volume 21, Issues 2-3, December 2003, Pages 143-151

Urban Terrestrial Carbon. According to American Forests, the nation's urban areas as defined by the Census Bureau have lost 21% of their tree cover in the last decade. Stephen Bratkovich, a forester with the U.S. Forest Service in St. Paul, Minn., has drawn from published studies to calculate that cities produce about 3.8 billion board feet of usable logs each year due to natural mortality, disease, storm blow-downs and development -- more wood than harvested from all of the country's 147 million acres of national forestlands. Private citizens shoulder much of the burden as urban foresters. In Los Angeles, the city government owns 1.5 million to 2 million trees, while businesses and homeowners are responsible for perhaps 10 million. "The Nation; No Safe Arbor in the City; Trees are disappearing from urban areas," *Los Angeles Times*, March 8, 2004

USDA Secretary Veneman Discussed the New Conservation Innovation Grants Program. USDA is making \$15 million available for competitive grants under this program, which is part of the existing Environmental Quality Incentives Program. At a Pennsylvania farm, Secretary Veneman said the program will give "Benefits to air quality by increasing the amount of carbon that is stored in the soil." Project proposals may address best market-based trading of pollution credits, adoption of best-management practices, and carbon sequestration. The Conservation Reserve Enhancement Program. "Remarks by Agriculture Secretary Ann. M. Veneman," *Global News Wire*, Regulatory Intelligence Data, March 23, 2004.

Evidence that Atmospheric CO₂ is Affecting Rainforests. William Laurance of the Smithsonian Tropical Research Institute in Panama and his team, whose research was published in the journal *Nature*, noticed that the growth of large trees in the Amazonian rainforests have accelerated over the past two decades while the growth of smaller ones has slowed. The fast-growing large trees are less dense than slow growing ones and they therefore hold less carbon overall. Scientists fear this is reducing the rate of forests' carbon absorption per acre. <http://www.reuters.co.uk/newsArticle.jhtml?type=scienceNews&storyID=4540139§ion=news> http://abc.net.au/science/news/scitech/SciTechRepublish_1063540.htm Full article: Laurance, W.F. et al.. *Nature*, 428, 171 - 175, (2004).

Design Incorporating Ecological Services. Architect William McDonough says he aims to design a building that "makes oxygen, fixes nitrogen, sequesters carbon, distills water, builds soil, accrues solar energy as fuel, makes complex sugars and food, creates microclimates, changes colours with the seasons and self-replicates." He has designed buildings for Nike, Gap, IBM, Ford, the Smithsonian Institution and the US Environmental Defense Fund. "Natural designs," *New Scientist*, March 20, 2004

Sequestration in the News, Cont'd

Federal Climate Change Science Program R&D Directions for Ecology. More than 100 researchers discussed the ecosystems chapter of CCSP's strategic plan and generated a detailed agenda for federal research, including: Determining the full costs and benefits of carbon sequestration initiatives and using alternative energy sources in lieu of fossil fuels; conducting experiments on and monitoring the effectiveness of restoring ecosystems; and evaluating the potential for genomic and proteomic research for ecosystems studies. "Scientists mull how ecosystems studies can strengthen climate change policies," *Inside Energy /with Federal Lands*, March 1, 2004, <http://www.platts.com>

Ocean

Ocean Experiments Sought. Scientist Peter Brewer seeks to conduct large-scale tests to determine the environmental impacts of elevated atmospheric CO₂ on the oceans. "The problem," Brewer says, "is that about 50 percent of the 400 billion tons of CO₂ we have put in the ocean is in the upper 200 meters. Since the average depth of the ocean is 4,000 meters, we are having a large impact on the shallow surface layers where most marine life is." *MSNBC*, March 18, 2004 <http://www.msnbc.msn.com/id/4286438/>

Trading

The Australian Sustainable Investments Fund (ASIF) Acquires Terrestrial Carbon Rights. ASIF recently agreed to buy 20,500 hectares of mainly freehold land in Victoria, South Australia and Western Australia from Timbercorp for \$46.6 million. Timbercorp will lease the land back but carbon rights vested in 15,800 hectares of standing timber will be transferred to the fund. There is still no legal framework for carbon trading in Australia. "Investors twig to carbon credits," *Australian Financial Review*, March 8, 2004

Environmental Fund Plans to Buy up Carbon Credits The US based Carbonfund.org aims to purchase 50,000 tonnes of CO₂ emissions credits this year - and retire them. It aims to double the volume of credits purchases within a year or two. Credits will be purchased from a variety of markets across the world. The current price asked by the fund for a tonne of CO₂ is \$5.50. <http://www.pointcarbon.com/article.php?articleID=3361&categoryID=147>

Policy

Washington State Legislature Passes Bill to Limit GHG Emissions. With bipartisan support, the 2004 state Legislature passed a bill requiring new power plants to offset 20 percent of the CO₂ they send into the air through mitigation projects. Eligible projects include energy conservation projects, forestland preservation or converting diesel-powered buses to natural gas. Power producers can either finance the projects on their own or pay an independent third party approved by state authorities to do it for them at the rate of \$1.60 per ton of CO₂ produced. http://www.theolympian.com/home/news/20040316/_environment/4976.shtml

Mark R. Maddox Named as Acting Assistant Secretary in DOE's Office of Fossil Energy. He replaces Carl Michael Smith who resigned from the position after two years of service. For more details, link to the DOE Fossil Energy Web Site at: <http://www.fossil.energy.gov>

Natural Resources Canada Announces Incentive for Industry to Capture and Store CO₂. The \$15 MM program can cover up to 50% of capital investment. The federal money will be coupled with \$15 million in royalty incentives announced last year by the Alberta government. The joint-effort is "a signal of cooperation" between the federal and provincial governments. "Carbon dioxide could help pump oil: \$30M to market technology," *Calgary Herald* (Alberta, Canada), March 2, 2004 Incentive program description is found at: http://www.nrcan-rncan.gc.ca/media/newsreleases/2004/2004-X2a_e.htm

EPA Welcomes New SmartWay Partners. Thirty-seven new freight industry partners have joined EPA's SmartWay Transport Partnership, bringing the total number of partners in the program to 52. SmartWay Transport is a voluntary partnership between freight industry sectors and EPA that establishes incentives for fuel efficiency improvements and greenhouse gas emissions reductions. A complete list of partners is available at <http://www.epa.gov/smartway/partners.htm>.

Northeast United States is Struggling to Make Progress Towards its GHG Emissions Reduction Goals Article says regional governments are doing what they can to reduce GHG emissions, but growth in emissions from automobiles, which are under the purview of the federal government, are overwhelming gains. *Boston Globe*, March 15, 2004 http://www.boston.com/news/local/articles/2004/03/15/region_struggles_on_greenhouse_emissions_goals

Geography and GHG Emissions Per Capita. Study correlates population density and coldness of climate with GHG emissions per capita. The author, Eric Neumayer, says, "It is often argued that high emitters should face more stringent emission reductions than low emitters. One needs to ask, however, why emissions are higher in one country than in another. High emissions can be partly the result of geographical disadvantage. In future negotiations, geographical differences across countries should be taken more into account." <http://www.sciencedaily.com/releases/2004/03/040302082113.htm>

Events

April 13-15, 2004, **15th Annual Earth Technologies Forum**, Washington, DC. <http://www.earthforum.com>

April 18 to 20, **Annual International Energy Conference: Repositioning in the Energy Sector: Pace and Directions**, Boulder, CO USA, <http://www.iceed.org>

April 18th - 22nd 2004, **29th International Technical Conference on Coal Utilization & Fuel Systems**, Clearwater, Florida, USA. Contact: Barbara A. Sakkestad, Vice President, Coal Technology Association, 601 Suffield Drive, Gaithersburg, MD 20878. BarbaraSak@aol.com www.coaltechnologies.com

Events

April 18-21, 2004, **American Association of Petroleum Geologists Meeting, Embrace the Future Celebrate the Past**, 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> Contact: AAPG Convention Department, P.O. Box 979, Tulsa, OK 74101-0979, USA. Tel: 1 800-364-2274 (USA and Canada) or +1 918-560-2679, convене@aapg.org

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 21st - 24th 2004, **2nd Latin American Symposium About Carbon Sequestration**, Curitiba, Parana, Brazil. Contact: www.ambientebrasil.com.br

April 25th - 30th 2004, **European Geosciences Union - 1st General Assembly**, Nice, France. Contact: EGU Office, Max-Planck-Str. 13, 37191 Katlenburg-Lindau, Germany. Tel: +49 5556 1440 Fax: +49 5556 4709 egu@copernicus.org, <http://www.copernicus.org/EGU/ga/egu04/>

April 26-30, **National Hydrogen Association 15th Annual Conference and Expo**. Agenda includes a session "Hydrogen from Coal." <http://www.hydrogenconference.org/>

May 2-6, 2004, **Third Annual Conference on Carbon Sequestration**, Alexandria, VA. For further information, please visit <http://www.carbonsq.com>

May 2-5, 2004, **10th National Clean Cities Conference and Expo**, Fort Lauderdale, FL. <http://www.ccities.doe.gov>

May 5-7, 2004, **GHG Registries, Climate Policy and the Bottom Line, California Climate Action Registry**, San Diego, CA. Topics include: The Future of U.S. Climate Policy; and GHG Registries in the U.S. and beyond. Breakout Sessions on: Industry GHG Accounting for the Electric Power, Oil & Gas, and Cement Industries Emissions, Trading and GHG Registries, Forest GHG Accounting. www.climateregistry.org/EVENTS/Conference

May 10 -12, 2004, **The Ocean in a High CO₂ World: An International Science Symposium**, UNESCO, Paris, France. An open symposium to address biological and biogeochemical consequences of increasing atmospheric and oceanic CO₂ levels. Overviews ocean sequestration strategies. Papers from the symposium will be published in a special issue of the Journal of Geophysical Research-Oceans. <http://ioc.unesco.org/iocweb/co2panel/HighOceanCO2.htm> or contact Ed Urban (scor@jhu.edu) or Maria Hood (m.hood@unesco.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/>

May 12-14, 2004, **Critical Elements of International Climate Policy**, Hamburg Institute of International Economics, Germany. Covers ten years climate policy research at Hamburg Institute Baselines and additionality, validation and verification of CDM projects, LULUCF and the Kyoto Mechanisms, and the role of sinks. <http://www.hwwa.de/climate.htm>

May 24 - 25, 2004 **5th Annual Coalbed and Coal Mine Methane Conference** The Brown Palace Hotel - Denver, CO. Includes sessions on innovative approaches to CBM recovery. http://www.srinstitute.com/ApplicationFiles/web/WebFrame.cfm?web_id=218&webpageid=2331&prioritycode=DEM004043

June 7-8, 2004, **Climate protection as development opportunity**, the Hamburg Institute of International Economics, Hamburg, Germany. Focus on the Clean Development Mechanism to reach development targets. Email a-michaelowa@hwwa.de with expressions of interest. <http://www.hwwa.de/climate.htm>

June 9 to 11, 2004, **World's First Carbon Expo**. Cologne, Germany Trade fair and conference on emissions trading and the emerging carbon market co-sponsored by the World Bank. "A watershed event in the emerging carbon market, it is the first opportunity for buyers and sellers of greenhouse gas emission reductions to meet face to face." <http://www.carbonexpo.com/>

CALL FOR PAPERS. June 10-11, 2004, **Energy & Agricultural Carbon Utilization Symposium: Sustainable Alternatives to Sequestration**, the campus of The University of Georgia in Athens, Georgia. Sessions focused on the use of charcoal and carbon black in terrestrial ecosystems. 2-page abstracts due by April 25th <http://www.georgiaitp.org/carbon>

CALL FOR PAPERS. November 7-12, 2003 **American Institute of Chemical Engineers (AIChE) Annual Meeting** Austin, TX, Session 09005, Greenhouse Gas Sequestration Technology. Proposals covering technologies for (1) separation and capture, (2) transport, and/or (3) long-term sequestration (geologic, terrestrial, etc.) of greenhouse gases are especially desired. CO₂ is the focus, but technologies specific to other greenhouse gases (CH₄, N₂O, etc.) are also welcomed. Proposals to Present (PTP) technical papers can be submitted at <http://www.aiche.org/annualapp> The deadline for submission is May 2.

Recent Publications

"**Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2002**" is now available as part of its 30 day public comment period. The inventory includes projections for sinks removing CO₂ from the atmosphere. The inventory reports a reduction of 958 mt CO₂ in 1990, rising to 1,055 mt CO₂ in 1996 then dropping to 691 mt CO₂ in 2002. The draft report can be obtained by visiting the U.S. EPA's global warming site at: <http://www.epa.gov/globalwarming/publications/emissions/>.

"**Statehouse and Greenhouse**," a book by University of Michigan professor Barry Rabe examines the growing role played by state governments in reducing greenhouse gas emissions. <https://www.brookings.edu/>

Recent Publications

"Tools of the Trade: A Guide to Designing and Operating a Cap and Trade Program for Pollution Control" A guide available from EPA draws upon the experience of the highly successful sulfur dioxide trading program used to address acid rain. It includes appendices on the economics of emissions trading and an example assessment of the potential for cap and trade. "Tools of the Trade" may be downloaded at: <http://www.epa.gov/airmarkets/international/tools.pdf> (1.05 Megabyte)

"Effects of CO₂ Emission Reduction Strategies on Air Pollution" Taking into account the relevant energy, environmental and political framework, the study assesses the influence of CO₂ emission reduction strategies for the German state of Baden-Wuerttemberg on emissions of SO₂ and NO_x. No Link. Published in *International Journal of Global Environmental Issues* 3 (3, 2003): 245-265

Appropriate measures for Conservation of Terrestrial Carbon Stocks - analysis of trends of forest management in Southeast Asia, Dr. N. Kim Phat, *Journal of Forest Ecology and Management* <http://authors.elsevier.com/sd/article/S0378112704000428>

Oil Crises & Climate Challenges - 30 Years Of Energy Use In IEA Countries This publication examines how energy efficiency and other factors such as economic structure, income, lifestyle, prices, and fuel mix have shaped developments of energy use and CO₂ emissions in IEA countries over 30 years. <http://www.iea.org/dbtw-wpd/bookshop/add.aspx?id=174>

Legislative Activity

House Bill to Cap and Trade CO₂ from electricity generation, transportation, industrial, and commercial economic sectors. Representative Gilchrest (R-MD) and John Olver (D-MA) introduced The Climate Stewardship Act on March 30, a House companion bill to McCain and Lieberman's Climate Stewardship Act. "Bipartisan House Bill Takes Aim at Global Warming," *Environment News Service*, March 31, 2004, <http://www.climateark.org/articles/reader.asp?linkid=30615>

Lieberman to McCain to Reintroduce their Global Warming Bill to the US Senate Later this Year. Said US senator Joseph Lieberman (D-Conn.) to Senator John McCain (R-Ariz.) during a hearing on March 5, "Last fall, we garnered the support of 44 senators. Before this spring turns to summer, I pledge to work with you to bring our bill to the floor again for a vote, and I know we can do even better this time." <http://www.pointcarbon.com/article.php?articleID=3342&categoryID=147>

Senate's Daschle says has votes to pass energy bill, - Senate Democratic Leader Tom Daschle on Tuesday said there are enough votes in the chamber to pass a slimmed-down \$16 billion energy bill, which Republicans could set for a vote later this month. *Reuters*, March 2.