

THE CARBON SEQUESTRATION NEWSLETTER

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September 2003

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

Sequestration in the News

DOE names regional sequestration partners. The U.S. Department of Energy named seven regional partnerships that will make up a nationwide network to study the most suitable carbon sequestration methods for specific areas of the country. The organizations will also determine possible regulatory and permitting requirements, along with infrastructure needs that would be necessary to implement carbon sequestration. The DOE will provide approximately \$11.1 million (up to \$1.6 million per partnership) of support over the next two years, and participating organizations will contribute another \$7 million – an average of nearly 40% of the initial funding. <http://www.fossil.energy.gov>, http://www.netl.doe.gov/publications/press/2003/tl_sequestration_partnershipselections.html

Wyoming hopeful FutureGen site. Several eastern Wyoming counties say the area's productive coal mines and aging oilfields make it the best site for FutureGen, the White House's \$1 billion zero-emissions power generation and CO₂ sequestration initiative. "Counties vie for \$1 billion clean coal plant," *Casper Star Tribune*, August 25, <http://www.casperstartribune.net/articles/2003/08/25/news/wyoming/8308c5068b298bc0fae5b6b19e2647e6.txt>

CO₂ not a pollutant. The Bush administration has decreed that CO₂ from industrial emissions is not a pollutant nor does the administration have the power under the Clean Air Act to declare CO₂ emissions from autos as a pollutant. "US says CO₂ is not a pollutant," *The Independent*, August 31, <http://news.independent.co.uk/world/americas/story.jsp?story=438719> and "EPA says won't regulate CO₂ emissions from autos," *Reuters*, August 29, <http://reuters.com/newsArticle.jhtml?type=politicsNews&storyID=3354122> See also: "A change of air," *Washington Post*, <http://www.washingtonpost.com/wp-dyn/articles/A5513-2003Aug30.html>

Announcements

Nominations invited for 2004 EPA Climate Protection Awards. The Climate Protection Partnerships Division of the U.S. Environmental Protection Agency invites nominations for the 2004 Climate Protection Awards to recognize leadership, innovation, dedication, and technical achievements in protecting the climate. The application deadline is October 1. <http://www.epa.gov/cpd/awards/climproawards.htm>

NETL news posted on the Reference Shelf:

A fact sheet entitled "Carbon Sequestration on Surface Mine Lands," August 18, <http://www.netl.doe.gov/publications/factsheets/project/Proj235.pdf>

A fact sheet entitled "Restoring Sustainable Forests on Appalachian Mined Lands for Wood Products, Renewable Energy, Carbon Sequestration, and Other Ecosystem Services," August 11, <http://www.netl.doe.gov/publications/factsheets/project/Proj236.pdf>

An article entitled "Degradation Pathways for Monoethanolamine in a CO₂ Capture Facility," July 29, <http://www.netl.doe.gov/coalpower/sequestration/pubs/articles/ef020272i.pdf>

Geologic Sequestration

Japan's geologic sequestration field test. An experiment to store captured CO₂ 1,100 meters underground is underway in Nagaoka, Niigata Prefecture. The five-year experiment, conducted at the Iwanohara oil storage site of Teikoku Oil Co., is led by the Research Institute of Innovative Technology for the Earth, a Kyoto-based foundation. The experiment involves injecting about 20 tons of CO₂ a day into onshore and offshore aquifers through wells, while monitoring the movement of CO₂ through three observation wells. The plan is to inject 10,000 tons of CO₂ over 18 months. "Experiment under way to store CO₂ 1,100 meters," *Japan Economic Newswire*, August 7.

Asian CO₂ EOR project. A team of Asian electric power interests is considering capturing CO₂ emitted from liquefied natural gas production facilities for enhanced oil recovery in Indonesia. If implemented, the project would be the largest CO₂ enhanced oil recovery effort in the world. The study will focus on a technique called "flue gas decarbonization technology," developed by KEPCO and Mitsubishi jointly. "Asian interests look at new CO₂ storage scheme," *The Electricity Daily*, August 7.

Sequestration in the News, Cont'd

Geology

BLM approves CO₂ pipeline. The pipeline project will move CO₂ 125 miles from southwest Wyoming to Anadarko's Salt Creek oil field north of Casper, Wyoming. The CO₂ comes from Exxon/Mobile's Shute Creek natural gas processing plant and Anadarko will inject about 7,200 tons of CO₂ per day. "CO₂ pipeline project approved," *The Associated Press State & Local Wire*, August 12.

R&D to turn underground CO₂ back into fuel. The DOE Office of Science has funded a project through its small business research grants to turn CO₂ in geologic storage sites back into methane. Advanced Resources International will develop a methodology to use bacteria to remediate underground CO₂, creating new methane resources in the process. "Small businesses get \$100M to develop array of innovative energy devices," *Inside Energy /with Federal Lands*, August 4.

High oil prices still don't prompt new EOR. Wellhead prices of \$25-\$30 per barrel are not prompting new EOR projects at the rate the economics would support, according to these two articles. EOR ventures are capital intensive, and producers so far have stuck to less expensive methods. The CO₂ from an Exxon/Mobil gas processing plant in southwestern Wyoming is available, and some of the CO₂ goes to an Exxon EOR project in Colorado, but most of it is vented into the atmosphere. "High oil prices not prompting EOR projects," *Oil Daily*, August 12, also "North Dakota producers still not buying CO₂ for oil recovery," *Associated Press State & Local Wire*, August 21.

CO₂ flooding and other IOR methods. An article on all aspects of improved oil recovery (IOR), a term that encompasses enhanced oil recovery techniques, refers extensively to the Advanced Resources International (ARI) work done on EOR analysis. "Progress in IOR technology, economics deemed critical to staving off world's oil production peak," *Oil & Gas Journal*, August 4, <http://www.adv-res.com/>

Extract more oil with innovation. This article sets out a timeline and recommendations for technological improvements to avert an oil shortage crisis. Deepwater development, enhanced oil recovery using CO₂ or microbes, and self-renewing enclosed energy systems are some ideas tendered. "Oil change: In the pipeline?" *The Engineer*, August 8.

Ocean

Ocean algae genes decoded. With DOE and NSF funding, three international teams of scientists traced the genetic blueprints for four forms of photosynthetic organisms that can turn sunlight and CO₂ into biomass with very few (2000) genes. "Microbe project may aid CO₂ capture," *Inside Energy /with Federal Lands*, August 18, <http://www.platts.com> also "NSF Microbes' genomes promise insight into oceans," M2 Presswire, August 14, and "Genome sequence of the cyanobacterium *Prochlorococcus marinus* SS120, a nearly minimal oxyphototrophic genome," *Proceedings of the National Academy of Sciences*, August 19, vol. 100, no. 17 <http://www.pnas.org/cgi/content/abstract/100/17/10020>

Salinity decreases CO₂ absorption. Recent drought conditions in the North Pacific Ocean near Hawaii have decreased the strength of the CO₂ sink, according to a study published in the journal *Nature*. A team funded by the National Science Foundation (NSF) and led the University of Hawaii used 15 years of time-series measurements to compare the precipitation, salinity and CO₂ concentrations at Station ALOHA. "Ocean carbon cycle affected by drought," M2 Presswire, August 14. Also "Decrease in salt in ocean decreases amount of carbon dioxide," *The Associated Press State & Local Wire*, August 13, 2003, <http://www.soest.hawaii.edu/>

Terrestrial

Soil carbon MM&V. Researchers at the South Dakota School of Mines and Technology have earned a patent pending on a technique called C-Lock that could help farmers measure, certify and market the carbon stored in their soil. The Tech scientists also received a \$250,000 DOE grant to test the technique in the field. "Tech scientists doing carbon sequestration work," *The Associated Press State & Local Wire*, September 1. Also see, "Benefit to farmers from 'carbon trapping' up in the air," *Omaha World Herald*, August 23 and "New Technique Measures Carbon in Soil," *The Associated Press*, <http://www.nytimes.com/aponline/science/AP-Carbon-Research.html>

Soil and vegetative carbon capacity. New research by the UK Met Office's Hadley Centre for Climate Research found that the capacity of soil and vegetation to absorb CO₂ could become saturated over the next few decades, according to a paper published by the Institute for Public Policy Research. The Hadley Centre examined the complex interaction of CO₂ emissions and rising temperatures on vegetation and soils. "Scientists issue new warning on gas emissions," *Financial Times* (London), August 7.

Sequestration in the News, Cont'd

Climate warming effect on vegetation may increase soil moisture. Convention predicts that global warming may increase aridity in water-limited ecosystems by accelerating evapotranspiration, but this study by six researchers at Stanford University and the Carnegie Institution of Washington shows the reverse effect. In a 2-year grassland field experiment, simulated warming increased spring soil moisture by 5–10% under both ambient and elevated CO₂. Warming also made trees leaf out earlier, which decreased transpirational water losses. "Plants reverse warming effect on ecosystem water balance," *PNAS*, August 19, 2003 vol. 100, no. 17, <http://www.pnas.org/cgi/content/abstract/100/17/9892>

Bogs sink carbon. Britain's attempts to reduce GHGs could get a helping hand from the country's ancient bogs. Researchers at Leeds and Durham universities have found that the bogs offer a carbon reservoir almost as effective as tropical rainforests and that blocking modern drainage ditches would top up the existing bogland. "Bogs could deflate gas emissions," *The Guardian*, August 25, http://www.guardian.co.uk/uk_news/story/0,3604,1028763,00.html

Insured expiring credits for terrestrial sequestration. This overview of different strategies addressing non-permanence or reversibility of terrestrial carbon sequestration projects evaluates potential costs compared with uninsured, and permanent credits. Approaches include forest carbon insurance, land reserves, and issuance of expiring credits. "Replacing carbon lost from forests: an assessment of insurance, reserves, and expiring credits," *Climate Policy*, 3 (2, 2003), 107-122.

Identifying terrestrial carbon leaks. This analysis divides sources of leakage into primary and secondary types. The actors or agents responsible for baseline activities cause primary leakage, and secondary leakage occurs when the project's outputs create incentives for third parties to increase emissions elsewhere. The paper demonstrates leak identification for the case study of avoided deforestation projects. "A conceptual framework and its application for addressing leakage: the case of avoided deforestation," *Climate Policy*, 3 (2, 2003), 123-136.

Land use mitigation and the surface energy budget. Climate mitigation policies effect the surface albedo, the fluxes of sensible and latent heat to the atmosphere, and the distribution of energy within the climate system. Changes in these components can affect the local, regional, and global climate, but recognition of these effects challenges a system of credits and debits where sequestration of carbon in the biosphere is equated with emission of carbon from fossil fuels. "The climate impacts of land surface change and carbon management, the implications for climate-change mitigation policy," *Climate Policy*, 3 (2, 2003), 149-157.

The Noel Kempff Mercado Climate Action Project (NKMCAP) local community benefit? The long-term impact of the Bolivian carbon sequestration project on the local communities may be positive, however, in the short run, certain sections of the local communities are financially poorer, according to this study. "Can forest-protection carbon projects improve rural livelihoods? Analysis of the Noel Kempff Mercado Climate Action Project, Bolivia," *Mitigation and Adaptation Strategies for Global Change*, 7 (4, 2002), 323-337.

Super-trees. The Japanese Ministry of Education, Culture, Sports, Science and Technology has started a project to develop genetically modified trees to absorb more CO₂. "JP: Gov't eyes genetically modified trees to fight greenhouse gases," *Kyodo News*, August 27, <http://www.co2e.com/News/story.asp?StoryID=1247>. Also, scientists are planting genetically engineered trees in areas around this country that may help deforestation and supply growing paper demands. "Genetically engineered trees sprout," *MSNBC*, http://www.msnbc.com/modules/exports/ct_email.asp?news/947076.asp

Leasing reduction certificates in CDM forestry. As vegetation is an unstable dynamic system, emission credits generated by carbon sink projects under the Clean Development Mechanism (CDM) of the UN Framework Convention on Climate Change (FCCC) Kyoto Protocol suffer from an inherent permanence risk. This article discusses the pros and cons of two approaches to balance GHG emissions and carbon uptake in vegetation: the ton-year approach and temporary credits. "Fractions of permanence: squaring the cycle of sink carbon accounting," *Mitigation and Adaptation Strategies for Global Change*, 7 (4, 2002): 381-402.

Forest clean-up to fuel biopower. Trees cleared from Arizona's forests will provide fuel for an Arizona Public Service Co. (APS) power plant instead of being burned in the forest. Annual GHG emissions are expected to be reduced by up to 15,000 tons per year by burning the woodchips under controlled conditions. "Arizona biomass plant offers many benefits," *Business Wire*, August 27, http://www.businesswire.com/cgi-bin/cb_headline.cgi?&story_file=bw.082603/232385831&directory=/google&header_file=header.htm&footer_file= See also: <http://www.solaraccess.com/news/story?storyid=4977>

World water and climate change. This paper assesses the terrestrial water cycle and the impact of climate change by running a macro-scale water balance model and two General Circulation Model (GCM)-based climate change scenarios. The results show that in 2021-2030, water demand will increase worldwide due to climate change. Water shortage is expected to worsen in western Asia, the Arabian Peninsula, northern and southern Africa, northeastern Australia, southwestern North America, and central South America. A significant increase in surface runoff is expected in southern Asia and a significant decrease is expected in northern South America. "Terrestrial water cycle and the impact of climate change," *Ambio*, 32 (4, 2003), 295-301.

Sequestration in the News, Cont'd

Trading

Emissions Trader newsletter. The August 2003 issue of the Emissions Marketing Association's (EMA) newsletter, The Emissions Trader, contains two (2) feature articles on ethical obligations of traders within the emissions trading industry, and the process by which a price index, developed by EMA, was implemented within industry for SO₂ and NO_x allowances in the United States' emissions markets. <http://www.emissions.org/>

On CO₂ emissions trading in the US. Washington State and Northeastern US governors consider proposals to reduce CO₂ emissions from power plants. "The States step up," *Tide Pool*, August 29, http://www.tidepool.org/original_content.cfm?articleid=85776

EPA's Climate and Waste program seeks input on new GHG tool. A new Manufacturing and Purchasing Greenhouse Gas (MAP-GHG) tool allows users to calculate the GHG benefits of using recycled inputs in the materials they manufacture and/or purchase. For more background on EPA's analysis of climate change and waste management, check out the report entitled: Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Greenhouse Gas Emissions and Sinks at <http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsWasteToolsReports.html>

World Bank and Czech Republic trade CO₂. Czech Environment Minister signed an agreement with the World Bank in which the bank will pay the Czech Republic between USD \$4 and \$7 million for more than 1 million tons of emissions that the country saves by the year 2012. "Ambrozeb signs deal with world bank regarding emissions," *Prague Business Journal*, August 1, <http://www.pbj.cz/user/article.asp?ArticleID=183124>

Policy

States urged to act. At the National Association of Regulatory Utility Commissioners meeting, government officials encouraged state regulators to pressure utilities to improve emissions associated with coal-fired generation. "States urged to move on emissions, but some regulators question urgency," *Electric Utility Week*, August 4, <http://www.platts.com>

Massachusetts and New York Governors to hash out CO₂ plan. MA Governor Romney accepted NY Governor Pataki's invitation to design a regional CO₂ emissions cap for power plants. "Romney accepts request to develop regional carbon emissions cap," *Lincoln Journal*, July 30, http://www.townonline.com/lincoln/news/local_regional/lin_newjstatecarbon07302003.htm

Commentary on US climate policy in the Bush era. "EPA tilt on global warming," *Washington Times*, August 8, <http://www.washtimes.com/commentary/20030809-110407-6331r.htm>

Japan and US plan to capture and store CO₂. Japan and the United States signed a deal to cooperate on 11 projects to collect CO₂ from emitting facilities like thermal power plants and dissolve it into water deep in the sea. "Japan, US sign global warming prevention deal," *Kyodo News*, August 8, <http://www.japantoday.com/e/?content=news&cat=1&id=269048>

Air travel tax. A report to be issued by the Commission for Integrated Transport calls for a European Union-wide CO₂ emission charge to be set at 70 per tonne of carbon. "Plea on airline pollution taxes," *Financial Times*, September 1, http://search.ft.com/search/article.html?id=030901000766&query=emission&vsc_appld=totalSearch&state=Form See also: "Radical aviation tax plans proposed," *The Irish Examiner*, September 1, <http://www.examiner.ie/breaking/2003/09/01/story111734.html>

State and local greenhouse gas reduction programs. The Pew database currently contains 42 case studies of programs from 27 states. Three new case studies have been added from California's Greenhouse Gas Standards for Vehicles program, Maryland's Smart Growth program, and Pennsylvania's Green Pricing: Electric Consumer Choice program. Pew Center on Global Climate Change, August, 2003, <http://ealert.pewclimate.org/ctt.asp?u=438171&l=3894>

US and South Africa committed to the UN Framework Convention on Climate Change. South Africa reiterated its commitment to the Kyoto Protocol during the meeting. "SA, US agree to work together on climate change," SPA, July 30, <http://www.mg.co.za/Content/l3.asp?ao=18031>

California's climate registry grows. 35 organizations and companies, representing \$140 billion in annual revenues, now participate in California's program for reducing GHGs. "California climate registry makes headway," *GreenBiz*, August 6, http://www.greenbiz.com/news/news_third.cfm?NewsID=25397

Canada Kyoto programs. The Canadian federal government will provide more than \$1 billion for new programs, including energy efficiency rebates for homeowners, under its plan for meeting Canada's commitments under the Kyoto Protocol. "\$1 billion Kyoto plan on the way, sources say," *Toronto Star*, August 8, http://www.thestar.com/NASApp/cs/ContentServer?GXHC_gx_session_id=5965b75fa46335dd&pagename=thestar/Layout/Article_Type1&c=Article&cid=1060294210249&call_pageid=968332188492&col=968793972154

Events

September 7-11, **American Chemical Society National Meeting**, New York, NY. Advanced technical session entitled: "CO₂ sequestration: advanced technologies for predicting and monitoring isolation performance"
<http://www.chemistry.org/portal/a/c/s/1/neworleans2003.html?DOC=meetings\newyork2003\03NYearly.html>

September 8, **AAPG-SPE Eastern Meeting CO₂ session**, Pittsburgh, PA. <http://www.aapg-spe-2003.org/technical.html>

September 15-19, **Twentieth Annual International Coal Conference**, Pittsburgh, PA. <http://www.engr.pitt.edu/pcc/>

September 21-23, **21st Annual Hart World Fuels Conference: The Future of the Refining and Automotive Industries: Understanding the Impact of Technology and Policy Change**, Washington, DC. Contact: Tel. 301-354-2045 or 1-800-872-3835 Fax: 301-424-7260 Email: registration@worldfuels.com, <http://www.cvent.com/>

September 21-23, **Emissions Marketing Association (EMA) 7th Annual Fall Meeting & International Conference**, Miami, Florida. <http://www.emissions.org/conferences/fallconference03/default.html>

September 22-23, **Coal: A Sustainable Future**, Pittsburgh, Pennsylvania. <http://www.coalmarketingdays.platts.com/>

September 30 - October 1, **Efficient Use of Biomass for GHG Mitigation**, Ostersund, Sweden. IEA bioenergy task 38 ("Greenhouse Gas Balances of Biomass and Bioenergy Systems") investigates processes involved in the use of bioenergy and carbon sequestration systems. Contact: susanne.woess@joanneum.at; <http://www.joanneum.at/iea-bioenergy-task38/workshops/announcement.pdf> or <http://www.ieabioenergy.com/>

October 10-11, **The 7th Ph.D. Workshop on International Climate Policy**, Hamburg Institute of International Economics (HWWA), Germany. <http://www.sls.wageningen-ur.nl/enr/ICP/>

October 12-15, 2003, **Gasification Technologies 2003**, San Francisco, CA. <http://www.gasification.org/Conference/annual.html>

October 15-17, **The Coalition for Agricultural Soils Mitigation of Greenhouse Gases (CASMGs) Carbon Measurement and Monitoring Forum**, Manhattan, KS. http://www.oznet.ksu.edu/ctec/Fall_Forum.htm

October 21-23, **Carbon Sequestration and Clean Development Mechanism**, Manila, The Philippines. An international conference on tropical forests and climate change. <http://www.enfor.com.ph/announcements.html>

November 2-6, **The 12th International Conference on Coal Science**, Cairns Convention Centre, Cairns, Australia. Topics include: Global warming, GHG emissions, CO₂ mitigation and sequestration. <http://www.aie.org.au/iccs/>

November 4-5, **Delivering Climate Technology: Programmes, Policies and Politics**, London, UK. Organized by the Royal Institute of International Affairs in association with the Carbon Trust. <http://www.riia.org/index.php?id=5&cid=36>

November 10-22, **IAI Summer Institute on Global Warming and Climate Changes: Causes, Mitigation Alternatives and International Actions**, Piracicaba, Brazil. The institute will be held in collaboration with the Center for Nuclear Energy applied to Agriculture of the University of Sao Paulo and the soil carbon sequestration research unit of the Research Institute for Development of France. http://www.iaisummerinstitutes.iai.int/Files/SI03/GW_Announcement_English.pdf

November 16-21, **The American Institute of Chemical Engineers annual meeting**, San Francisco, CA. The Environmental and the Catalysis and Reaction Engineering divisions will sponsor two "GHG Sequestration Technology" sessions. <http://www.aiche.org/Annualapp/previewmodule/grouplist.asp?groupcode=09&>

November 18-19, **US Emissions Trading Conference CALL FOR PAPERS**, Washington, DC. Papers on the business-benefits of emissions trading in the US market, the state vs. federal vs. international emissions strategies companies can use, the role of CDM and JI in the carbon emissions market, or other relevant material. Contact Gareth Pearce at gareth.pearce@iqpc.co.uk

December 8-12, **AGU Fall meeting CALL FOR PAPERS**, San Francisco, CA. Abstracts due September 4th for a special sequestration section, "Geophysical field studies and techniques applied to underground storage of greenhouse gas emissions in all phases of site characterization, injection and storage operations and monitoring."
<http://www.agu.org/meetings/fm03/>

April 18-21, 2004, **American Association of Petroleum Geologists Meeting**, 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 Co Chairs of CO₂ Sequestration Sessions (DEG), Nicholas Woodward and Susan Hovorka, at nick.woodward@science.doe.gov and susan.hovorka@beg.utexas.edu; <http://www.aapg.org/meetings/dallas04/index.html>

Recent Publications, cont'd

"The Carbon Dioxide Dilemma: Promising Technologies and Policies," *National Academies Press*, August 2003, http://www.nap.edu/catalog/10798.html?onpi_listserv082203

"Estimating Climate Sensitivity: Report of a Workshop," *National Academies Press*, August 2003, http://www.nap.edu/catalog/10787.html?onpi_listserv082203

Power sector adaptations to carbon constraints. A study of the European power generation sector under a mandatory emissions reduction program found that in the medium term many European generators are likely to convert existing coal-fired capacity to burn gas, extend the lives of nuclear capacity and replace old inefficient coal-fired plants with more efficient plants. In the long-term the economic potential of carbon sequestration could allow coal to be considered a sustainable energy source. "Options, costs and strategies for CO₂ reductions in the European power sector," *Energy Studies Review* 11 (2, 2003): 171-204.

Economic effects of northern European carbon reductions. This paper provides a survey of top-down modeling analyses of carbon abatement mitigation costs, distributional effects and ancillary benefits in the Nordic countries, the U.K. and Ireland. According to the analyses, modest emissions reductions can be met without substantial costs for the countries studied. The gross domestic product or welfare effects are mostly in the range of -0.4 and 1.2 percent when carbon emissions are reduced by 20-30 percent. "Mitigation costs, distributional effects, and ancillary benefits of carbon policies in the Nordic countries, the U.K., and Ireland," *Mitigation and Adaptation Strategies for Global Change*, 7 (4, 2002), 339-366.

Natural disasters and policy. The website for the Second International Conference on Early Warning 'Integrating early warning of natural disasters into public policy' (EWCII, Bonn, 16-18 October) is now available on-line at: <http://www.ewc2.org/>

Legislative Activity

The Energy Plan. A deadlock in the US Senate over energy legislation ended, when Republican leaders abruptly agreed to shelve their proposal in favor of a measure passed last year under Democratic leadership. "Senate breaks deadlock, passes 2002 Energy Bill," *Washington Post*, August 1, <http://www.washingtonpost.com/wp-dyn/articles/A11019-2003Jul31.html> See also: <http://www.nytimes.com/2003/08/01/politics/01ENER.html?ex=1060315200&en=d19063ff3dfa9612&ei=5062&partner=GOOGLE> "US energy policy," *Financial Times*, August 5, http://search.ft.com/search/article.html?id=030805000487&query=energy&vsc_appld=totalSearch&state=Form For a copy of the Bill, see H.R.6, Energy Policy Act of 2003, July 31. <http://thomas.loc.gov/cgi-bin/bdquery/z?d108:h.r.00006>:

Still generating political pressure on CO₂. U.S. Senator John McCain knows he doesn't have the votes to win, yet he is determined to challenge President Bush head-on over global warming by pushing for a Senate vote on climate change, says this article. "McCain pushes on greenhouse gases," *Associated Press*, July 31, <http://www.ledger-enquirer.com/mld/ledgerenquirer/news/6424006.htm> See also: "Inhofe urges Senate to reject caps on CO₂ emissions," *Waste News*, <http://www.wastenews.com/headlines2.html?id=1059598593>