

THE CARBON SEQUESTRATION NEWSLETTER

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August 2003

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

Sequestration in the News

The Carbon Sequestration Leadership Forum news. The Carbon Sequestration Leadership Forum (CSLF) met for the first time at the end of June. Several more stories have been reported in addition to what was covered last month. These are: "World Coal Forms CO₂ Sequestration Group," *The Electricity Daily*, July 2, 2003; "U.S.: Carbon sequestration 'critical' to continued fossil energy reliance," *Inside Energy /with Federal Lands*, June 30, 2003; and "Abraham Pushes Carbon Sequestration Technologies," *New Technology Week*, June 30, 2003, <http://www.fe.doe.gov/programs/sequestration/cslf/>

Plan to capture and store CO₂ under South Wales seabed. Greenhouse gases captured from the Valleys Energy Ltd clean coal Integrated Gas Combined Cycle power station may be buried off the South Wales coast. The potential for CO₂ storage depends on the legal resolution of London and Oskar Convention issues. Project planners refer to Sleipner to illustrate precedence. "Plan to bury tons of CO₂ off coast," *Western Mail*, June 27, 2003, <http://icwales.icnetwork.co.uk/0100news/0200wales/page.cfm?objectid=13115106&method=full&siteid=50082>

States' actions. Several U.S. states are working on legislation to reduce greenhouse gas emissions. "States warming up to CO₂ reduction laws," *Chicago Tribune*, June 29, 2003, <http://www.centredaily.com/mld/centredaily/news/6197074.htm> More than a dozen states are taking it upon themselves to address GHGs. "States taking measures to combat global warming," *Centredaily.com*, July 24, 2003, <http://www.centredaily.com/mld/centredaily/news/6368606.htm>

CO₂ sequestration in Waste News. An article covers the Air & Waste Management Association's 96th annual conference discussion concerning CO₂ sequestration technology. NETL's Carbon Sequestration Science Focus Area Leader, Curt White, and Antonia Herzog, Natural Resources Defense Council give their views on the role of carbon sequestration technology in the electric-generating industry. "Injecting two points of view: Experts debate carbon sequestration," *Waste News*, July 7, 2003, [http://www.netl.doe.gov/coalpower/sequestration/pubs/articles/Waste News Carbon Sequestration Story.pdf](http://www.netl.doe.gov/coalpower/sequestration/pubs/articles/Waste%20News%20Carbon%20Sequestration%20Story.pdf)

CDM CO₂ EOR project. Kansai Electric Power Co and Electric Power Development Co will participate in a detailed feasibility study of CO₂ EOR (Enhanced Oil Recovery) in Indonesia led by Nissho Iwai Corp and Mitsubishi Heavy Industries Ltd. The project will be carried out under the clean development mechanism (CDM). "Carbon dioxide project in Indonesia to begin," *Asia Pulse*, July 1, 2003, <http://www.atimes.com/atimes/Japan/EG01Dh01.html>; also "MHI, KEPCO, Nissho Iwai Feasibility Study for a Large-scale CO₂ Reduction Project to Prevent Global Warming," *Japan Corporate News Network*, July 3, 2003, http://www.japancorp.net/Article.Asp?Art_ID=5451

Announcements

New Carbon Sequestration Science Focus Area (CSSFA) web page. There is now a web page for CSSFA projects and related information. Go to <http://www.netl.doe.gov/coalpower/sequestration/> and click on the "In-House Research" link on the left side.

Second Annual Conference on Carbon Sequestration Proceedings available on CD. Persons who were not able to attend the Second Annual Conference on Carbon Sequestration can obtain a copy of the proceedings on CD by emailing Barbara Turner at bjturner@accessam.net The cost for non-participants is \$395 and participants may request a free copy. Also, the Third Annual Conference on Carbon Sequestration dates have been finalized: it will be held in Washington, DC the week of May 3, 2004. A call for papers will be issued within the next 30 days.

DOE issues "A Prospectus for Participation by Foreign Governments in FutureGen". The U.S. Department of Energy has published prospectus inviting foreign governmental agencies to participate in the FutureGen project. <http://www.fe.doe.gov/programs/powersystems/futuregen/internationalprospectus6-17-03.pdf>

Two DOE Solicitations. Carbon sequestration is mentioned in two broad procurement efforts: the DOE Small Business Innovation Research and the solicitation for grants in basic energy, biological and environmental sciences by the DOE Office of Science. <http://sbir.er.doe.gov/sbir> and <http://e-center.doe.gov/>

Geology

ECBM domestic capacity assessment. Scott Reeves of Advanced Resources International provides detailed reservoir studies of two enhanced coalbed methane recovery (ECBM) field projects in the San Juan basin of New Mexico in this article. Potential by basin totals about 90 Gt for CO₂ sequestration and 152 tcf for ECBM recovery. The study found that between 25 and 30 Gt of CO₂ can be sequestered at a profit and between 80 and 85 Gt can be sequestered at costs less than \$5/ton. "Enhanced CBM recovery, coalbed CO₂ sequestration assessed," *Oil & Gas Journal*, July 14, 2003.

Incentives for Alberta CO₂ EOR. Alberta Energy's new royalty program offers a maximum of \$15 million worth of royalty credits over five years to offset 30 % of costs for CO₂ EOR projects. The oilpatch industry has recently come under criticism for using waterfloods over CO₂ due to cost concerns. "CO₂ future in oilpatch; government encouraging industry to move from water to carbon dioxide injections," *The Daily Herald-Tribune* (Grande Prairie, Alberta), June 30, 2003.

Terrestrial

Flight to study CO₂ emissions. A Cessna will fly over North America measuring and mapping GHG and ozone depleting emissions as part of COBRA (CO₂ Budget and Regional Airborne Study). The data will be linked in with ground and weather data from NOAA's Cooperative Station Networks, the Fluxnet Canada research network, and the AmeriFlux network of ground stations. Funding is provided NASA, NOAA, NSF, and DOE's Terrestrial Carbon Program. "Scientists seek data on greenhouse gas emissions," http://www.oar.noaa.gov/spotlite/archive/spot_greenhousegas.html

Free Air Carbon Dioxide Enrichment (FACE). FACE technology modifies vegetation microclimates to simulate climate change conditions. CO₂-enriched air is released from a circle of vertical pipes into plots up to 30m in diameter, as tall as 20 m. Hundreds of investigators use FACE facilities at about eight sites worldwide. This month, four stories in the news have referred to FACE; they are summarized below. Brookhaven National Laboratory, <http://www.face.bnl.gov/>

Mojave desert ecology CO₂ study. Some, but not all of the four desert shrub species exposed to an atmospheric CO₂ concentration of 550 ppm for three years were found to have reduced green leaf nitrogen content with respect to carbon. "Effects of elevated carbon dioxide on green leaf tissue and leaf litter quality in an intact Mojave Desert ecosystem," *Global Change Biology*, 9: 729-735, 2003.

Australian ozFACE. The ozFACE facility was established in North Queensland to examine potential impacts of climate change on tropical grassland systems, more than a quarter of Australian land. "Researchers now watching grass grow," *Northern Miner* (Australia), July 4, 2003.

Illinois soyFACE. University of Illinois soyFACE researchers have found that higher concentrations of CO₂ raise soybean yields 17 percent, while ozone lowers crop yield as much as 20 percent. Plants under increased CO₂ were found to return less water to the atmosphere. "Researchers test climate change's impact on crops," *Associated Press*, July 15, 2003, http://www.enn.com/news/2003-07-15/s_6552.asp. University of Illinois at Urbana-Champaign researchers collaborating with SoyFACE found that photosynthesis of maize increased 10 percent on average under projected 2050 CO₂ conditions. The jump in photosynthesis likely resulted from the plant maintaining higher water content in the leaves during the dry period. Also, at the end of a dry spell, carbon fixation increased as much as 41 percent. July 25, 2003, http://www.eurekalert.org/pub_releases/2003-07/uoia-icd072503.php

Open field crop fertilization with CO₂. AG Gas uses CO₂ emissions for open-field crop yield enhancement, using microtubes to distribute gas to the crops. AG Gas claims tomato production has increased up to 120%. "CO₂ Emissions: Turning a liability into an asset," *PRNewswire*, July 8, 2003, <http://www.aggas.com/>; http://biz.yahoo.com/prnews/030708/cgtu062_1.html

Deciduous trees store sufficient carbon for future growth. Researchers at the University of Basel Switzerland found that trees in a 100-year-old forest use an average of 33-45% of their carbon stores during the year. The team looked at leaves, branches and trunks in ten species, including deciduous oak, beech and maple plus evergreens spruce, fir and pine, and found that deciduous species store sufficient carbon to replace all of their leaves at least four times over. Evergreens stockpile enough for half a new set of needles. "Non-structural carbon compounds in temperate forest trees," *Plant, Cell and Environment*, 26, 1067-1081, (2003); "Old trees poor carbon sponge? Carbon stockpiles question idea that forests will counteract global warming," July 23, 2003, <http://www.nature.com/nsu/030721/030721-6.html>; and "New research suggests trees are bad carbon sinks," *Edie weekly summaries*, July 25, 2003, http://www.edie.net/gf.cfm?L=left_frame.html&R=http://www.edie.net/news/Archive/7310.cfm

Terrestrial cont'd

ORNL Poplar research. Scientists at Oak Ridge National Laboratory are studying genes and hormones in the poplar tree that could be modified to improve carbon transport to roots. The research is part of DOE's Genomes to Life program. The poplar tree grows up to 4 meters annually and matures in about six years. "Poplar Trees: Getting to the Roots of Carbon Storage," *Genome News Network*, July 25, 2003, http://www.genomenewsnetwork.org/articles/07_03/poplar.shtml

Urban trees not stunted by ozone pollution. Researchers from Cornell University grew the same cottonwood clone in urban and rural sites and found that urban plant biomass was double that of rural sites. Apparently, higher rural ozone (O₃) exposures reduced growth at rural sites. "Urbanization effects on tree growth in the vicinity of New York City," *Nature*, 424, July 10, 2003.

Rivers transport CO₂ to the ocean for storage. A study demonstrates a decades-long increase in the export of carbonate dissolved alkalinity from soils to the Mississippi River. The research also suggests that agricultural lands may sequester more atmospheric CO₂ in rivers through soil weathering than forests. "Increase in the Export of Alkalinity from North America's Largest River," *Science*, July 4, 2003. Also "Yale University Study - Agricultural lands may store more CO₂ in rivers than forests," *M2 Presswire*, July 8, 2003, "New research on the accumulation and storage of carbon," National Public Radio, All Things Considered, July 4, 2003.

Farmers sequestering carbon. An article reviews last month's news about the USDA working to pay for land-use carbon sequestration, and gives an update on Entergy Corps' contract with nearly 80 farmers representing 6,470 production acres in northern Idaho, eastern Oregon and Washington State through the Pacific Northwest Direct Seed Association. The energy company paid \$75,000 to claim 30,000 tons over 10 years of estimated carbon reduction, about \$2.50 per ton. The estimated rate of storage is 0.55 tons of CO₂ per acre per year, which will be monitored and verified as direct seeded by local NRCS Conservation Districts. "Bush plan looks to natural ways to reduce gaseous emissions," *Gannett News Service*, June 27, 2003, http://www.directseed.org/carbon_synopsis.html

Coastal ocean may not be a carbon sink. Recent evidence shows the continental shelf of the Gulf of Papua is a source of CO₂ to the atmosphere, which is contrary to most current climate change models depicting the coastal ocean as an important site of removal of CO₂ from the atmosphere. The Australian Institute of Marine Science (AIMS) called TROPICS – Tropical River-Ocean Processes in Coastal Settings – found that the decomposition rate of organic matter is equal to or greater than the measured supply rate of organic matter from rivers and plant growth. The research has evolved into a new research program called Margins. "Wet tropics carbon sink? Are the wet tropics really a sink for carbon?" AIMS, June 16, 2003, <http://www.aims.gov.au/pages/about/communications/backgrounders/20030616-wet-tropics-carbon-sink.html>

Trading

CCX to open for trades in the fall. Chicago Climate Exchange (CCX) set the opening date of October 10, 2003 for trading, and contracted IntercontinentalExchange (ICE) to provide CCX's electronic trading platform. Atlanta-based ICE owns Europe's energy trading market, the International Petroleum Exchange. "CCX announces start of trading and provider of trade platform service," Chicago Climate Exchange, July 24, 2003, <http://www.chicagoclimateexchange.com/html/CCX072303.pdf> See also "ICE to provide platform for Chicago Climate Market," *Reuters*, July 24, 2003.

EU CO₂ to have a market value in 2005. The European Council of Ministers adopted an emissions trading law for the European Union that gives CO₂ a market value across the European Community from January 2005. "Europe adopts climate emissions trading law," *ENS*, July 22, 2003, <http://ens-news.com/ens/jul2003/2003-07-22-01.asp>

Japanese corporations step into trading. Matsushita Electric Industrial Co said Wednesday its group's 125 factories in Japan have introduced a trial GHG emissions trading scheme. "Matsushita introduces greenhouse gas trading scheme," *Kyodo News*, July 2, 2003, <http://www.japantoday.com/e/?content=news&cat=4&id=265128>

India to begin trading CO₂. 12 Indian firms have been cleared for carbon trading, the Union Environment Minister in India said. "12 firms to get nod for 'carbon trading'," *The Hindu*, June 30, 2003.

Sequestration in the News, Cont'd

Policy

Long-range plan for Northeast. Ten states in the Northeast have agreed to begin talks on creating a market-based compact to reduce CO₂ emissions from power plants. The timetable of the multi-state talks calls for an agreement in April 2005. The states of New York, Connecticut, New Jersey, Vermont, New Hampshire, Delaware, Maine, Pennsylvania, Massachusetts, and Rhode Island include four Democratic governors and six Republicans. "Ten states to discuss curbs on power-plant emissions," *New York Times*, July 25, 2003, <http://www.nytimes.com/2003/07/25/nyregion/25EMIS.html?ex=3D1059796800&en3D83f4a733c7c5bd7b&ei3D5062&partner3DGOOGLE>

The U.S. Climate Change Science Program (CCSP) Strategic Plan. The Bush Administration has released its Strategic Plan for developing knowledge of variability and change in climate and related environmental and human systems. Total government spending on climate-change related programs will be \$4.5 billion. "Bush Administration launches historic Federal climate change initiatives," U.S. Climate Change Science Program, July 24, 2003, <http://www.climatechange.gov/Library/pressreleases/pressrelease24jul2003.htm> Here are some reactions: "Bush plan on warming shifts focus from fuels," *Associated Press*, July 25, 2003; <http://www.iht.com/articles/104099.html> "Getting hotter," *Washington Post*, July 28, 2003, <http://www.washingtonpost.com/wp-dyn/articles/A54432-2003Jul27.html>

New Haven report to reduce GHGs. A Connecticut environmental group's analysis suggests how the state could cut GHG emissions 75 percent by 2050. "Report outlines 10 ways State can reduce greenhouse gases," *New Haven Register*, June 27, 2003, http://www.zwire.com/site/news.cfm?newsid=8741791&BRD=1281&PAG=461&dept_id=31007&rfi=6

Washington state legislates emissions mitigation. In Washington state, a CO₂ mitigation standard will apply uniformly to all plants, replacing the case-by-case approach currently used by the state Energy Facility Site Evaluation Council. "State poses emissions rules," *The Olympian*, July 14, 2003, <http://www.theolympian.com/home/news/20030714/southsound/51690.shtml>

Switzerland becomes the 111th country to ratify the Kyoto Protocol. *Swisspolitics*, July 9, 2003, "Switzerland has ratified the Kyoto Protocol," http://www.swisspolitics.org/en/news/index.php?page=news_inhalt&news_id=4021456&ion=ch

Global Environmental Change articles. This past month's issue contains, amongst others, the article "The Marrakech Accords to the Kyoto Protocol: analysis and future prospects," *Global Environmental Change*, July 2003, [http://www.sciencedirect.com/science?_ob=IssueURL&_toctext=%23TOC%236020%232003%23999869997%23439608%23FLA%23Volume_13,_Issue_2,_Pages_75-153_\(July_2003\)&_auth=y&view=c&acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=6526133814b68780556c167a5fe8f3c9](http://www.sciencedirect.com/science?_ob=IssueURL&_toctext=%23TOC%236020%232003%23999869997%23439608%23FLA%23Volume_13,_Issue_2,_Pages_75-153_(July_2003)&_auth=y&view=c&acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=6526133814b68780556c167a5fe8f3c9)

Events

August 19, **The Monitoring, Evaluation, Reporting, Verification and Certification of GHG Emissions: Energy-Efficiency Projects Workshop**, Seattle, Washington. Registrants of the 2003 International Energy Program Evaluation Conference are invited to attend. http://www.iepec.org/workshop_vine.htm

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/>

Events cont'd

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 14-17, **Innovative Methods for Emission-Inventory Development and Evaluation workshop**, Austin, TX. The workshop is being organized by North American Research Strategy for Tropospheric Ozone (NARSTO) at the University of Texas, Austin. <http://www.cgenv.com/narsto/EmissionsWorkshop.html>

October 21-22, **IPIECA Workshop on Carbon Dioxide Capture and Geological Storage: Contributing to Climate Change Solutions**, Brussels, Belgium. The workshop is free to all attendees although non-IPIECA industry participants will be asked to contribute a nominal fee of €400 to support the workshop reception and dinner. To register, contact Eleanor Fraser at Eleanor.fraser@ipieca.org no later than September 12th.

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 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 17-18, **Climate policy after 2012**, Ghent, Belgium, arranged by the Ghent University. For information e-mail johan.albrecht@rug.ac.be

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://submissions6.agu.org/fm03/search/search_detail.asp?sessid=164 or <http://www.agu.org/meetings/fm03/>

February 8-11, 2004, **A GTI Conference & Exhibition, Natural Gas Technologies II**, Phoenix, Arizona 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

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>

May 3, 2004, **The 3rd Annual Conference on Carbon Sequestration**, Washington, DC. A call for papers will be issued within the next 30 days.

Recent Publications

New information posted on the NETL Carbon Sequestration Reference Shelf: Presentations given at several recent meetings, the "Prospectus for International Participation" in the FutureGen Prototype Energy Plant of the Future, and a case study "Initial Design Phase of a Web-based Program to Catalyze Investments in Carbon Sequestration" have been posted on the Reference Shelf. NETL Carbon Sequestration Reference Shelf, <http://www.netl.doe.gov/coalpower/sequestration/>

Future US energy scenarios. A Pew report discusses three divergent paths for US energy supply and use from 2000 through 2035, and the effect of climate policy on the three scenarios. It also includes assessments of key energy technologies for the future. "US Energy Scenarios for the 21st Century." Pew Center on Global Climate Change, July 10, 2003, <http://www.pewclimate.org/document.cfm?documentID=244>

EIA analysis of McCain/Lieberman Bill scrutinized. The Energy Information Administration's economic analysis of S.139: the Climate Stewardship Act, was found to have unrealistic input assumptions by The Pew Center. http://www.pewclimate.org/policy_center/analyses/eia_analysis.cfm. The results of an incomplete, internal EPA analysis "diverge significantly" from the findings of the EIA analysis, finding that the senate plan could achieve its goal at very little cost. "New Estimates on Senate Carbon Dioxide Emissions Plan," *New York Times*, July 29, 2003, <http://www.nytimes.com/2003/07/30/science/30CLIM.html?ex=1060142400&en=08dd8>

The Pew Center on Global Climate Change invites comment on six working papers. Six pieces by climate experts from developed and developing countries examine core challenges in mobilizing effective international response to climate change as part of a new initiative called "Beyond Kyoto: Advancing the International Effort Against Climate Change." Comments are welcome through September 1, 2003. <http://www.pewclimate.org/>
"A Long-Term Target: Framing the Climate Effort," Jonathan Pershing and Fernando Tudela.
"Climate Commitments: Assessing the Options," Daniel Bodansky.
"Equity and Climate: In Principle and Practice," John Ashton and Xueman Wang.
"Addressing Cost: The Political Economy of Climate Change," Joseph Aldy, Richard Baron, and Laurence Tubiana.
"Development and Climate: Engaging Developing Countries," Thomas Heller and P.R. Shukla.
"Trade and Climate: Potential Conflicts and Synergies," Steve Charnovitz.

CERES rates companies on GHG emissions. A profile of 20 companies using a climate change governance checklist found that BP, Royal Dutch/Shell, Alcoa and DuPont have high scores, while ChevronTexaco, ConocoPhillips (COP), ExxonMobil, DaimlerChrysler, General Electric, Southern Company and TXU have low scores. Other profiled companies: American Electric Power, Cinergy, Ford Motor Company, General Motors, Honda, IBM, International Paper, Toyota, and Xcel Energy. The report was commissioned by CERES and written by the Investor Responsibility Research Center (IRRC). "Corporate Governance and Climate Change: Making the Connection," CERES, July 9, 2003, <http://ceres.org/newsroom/press/ceresirrcrel.htm> Also see <http://www.nytimes.com/2003/07/10/business/10WARM.html?ex=1058414400&en=7f1c44ea1c2b42d6&ei=5062&partner=GOOGLE>

Air & Waste Management Association's 96th annual Conference sequestration presentation. The Critical Review on Separation and Capture of CO₂ from Large Stationary Sources and Sequestration in Geological Formations - Coalbeds and Deep Saline Aquifers, by Curt White, Brian Strazisar, Evan Granite, James Hoffman, and Henry Pennline, June 25, 2003, <http://www.awma.org/ACE2003/criticalreview1.pdf> [5 MB].

Energy sector options. This study details the options available in the energy sector to reduce climate change. "Beyond Kyoto: Energy dynamics and climate stabilization," International Energy Agency, <http://www.euractiv.com/cgi-bin/cgint.exe?204&OIDN=251022&-home=analys>

Japanese Government calls for sustainable framework on climate change. The Japanese Ministry of Economy, Trade and Industry released an interim report on perspectives and actions to construct a future sustainable framework on climate change. The report was produced by METI's Global Environmental Subcommittee of the Industrial Structure Council's Environmental Committee, July 28, 2003, <http://www.meti.go.jp/english/index.html>

NZ report on non-CO₂ GHGs. "Abatement of agricultural non-carbon dioxide greenhouse gas emissions," New Zealand Ministry of Agriculture and Forestry, <http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/climate/abatement-of-agricultural-greenhouse-gas-emissions/httoc.htm>

World energy wrt CO₂ emissions. This working paper analyses the BP Statistical Review of World Energy with respect to CO₂ emissions from fossil fuel consumption. "Analysis of BP statistical review of world energy with respect to CO₂ emissions," Germanwatch, <http://www.germanwatch.org/rio/apbpst03.htm>

Recent Publications, cont'd

Cordis information service on GHG reduction support. Cordis, the European Commission's Research and Development Information Service, launched a service for research and specific support actions on non-nuclear energy issues. "New thematic service on 'sustainable energy systems' launched," *Cordis News*, July 2, 2003, http://dbs.cordis.lu/cgi-bin/srchidadb?CALLER=NHP_EN_NEWS&ACTION=D&SESSION=&RCN=EN_RCN_ID:20517

Carbon policies economics. "Effects of Carbon Policies and Technological Change on Consumer Surplus in Electricity Generation," Molly Macauley and Jih-Shyang Shih, RFF, June 2003, http://www.rff.org/disc_papers/PDF_files/0314.pdf

GHG permitting. "Managing Permit Markets to Stabilize Prices," Richard Newell, William Pizer, and Jianfeng Zhang, RFF, June 2003, http://www.rff.org/disc_papers/PDF_files/0334.pdf

Social impact of GHG allowances. Grandfathered emissions permits redistribute income to wealthy households by creating firm rents that ultimately accrue to shareholders. "Are Emissions Permits Regressive?" Ian Parry, RFF, June 2003, http://www.rff.org/disc_papers/PDF_files/0321.PDF

IETA & World Bank: Roadtest CDM Validation & Verification Manual. The International Emissions Trading Association and the World Bank Carbon Finance Group / Prototype Carbon Fund (WB PCF) have initiated a process to establish a CDM and JI Validation and Verification Manual. <http://www.vvmanual.info/>

DOE report on gasification technologies. NETL prepared a report on gasification performance for the Energy Information Administration's National Energy Modeling System (NEMS). The report includes an overview of refinery gasification and supporting technologies, such as acid gas removal, including a comparison of CO₂ separation designs. "Refinery Technology Profiles: Gasification And Supporting Technologies," NETL, July 28, 2003, <http://www.gasification.org/>

Legislative Activity

Modest carbon caps supported by GOP freshman. Senator Lamar Alexander, Republican from Tennessee, will back Senator Carper's legislation to impose modest CO₂ emission caps on U.S. power plants. He said more needs to be done given what is known about global warming. Alexander is the first Republican outside New England to sign on to the alternative multipollutant bill. Two other GOP moderates, Sens. Lincoln Chafee of Rhode Island and Judd Gregg of New Hampshire, also are sponsoring the Carper bill. "Alexander to back CO₂ limits on utilities," *The Energy Daily*, July 15, 2003.

Generating political pressure on CO₂. U.S. Senators John McCain and Joseph I. Lieberman are planning to compel a vote on an effort to control global warming when the Senate takes up the energy bill. "2 Senators aim to put others on record on emissions cap," *New York Times*, July 27, 2003, <http://www.nytimes.com/2003/07/28/politics/28ENVI.html?ex=1059969600&en=af9b981e86ca511a&ei=5062&partner=GOOGLE>

EPA analysis of Carper Bill. An Environmental Protection Agency analysis reveals that the CO₂-reduction plan in Senator Carper's alternative multipollutant bill can be carried out at negligible cost to industry. Retail prices for electricity would be only two-tenths of a cent per kilowatt higher than under Clear Skies. "EPA Withholds Air Pollution Analysis, Senate Plan Found More Effective, Slightly More Costly Than Bush Proposal," *Washington Post*, July 1, 2003, <http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&node=&contentId=A54598-2003Jun30¬Found=true>

Hearing on terrestrial sequestration. The Senate Environment and Public Works committee heard from Agriculture Department officials and other experts on ways to store carbon in crops and soil. Witnesses included Ann Veneman, Secretary of the U.S. Department of Agriculture; Rattan Lal, director of the Carbon Management and Sequestration Center, Ohio State University; Robert Stallman, president, American Farm Bureau Federation; Debbie Reed, legislative director, National Environmental Trust; Cynthia Rosenzweig, Goddard Institute for Space Studies; and Joseph Bast, president, the Heartland Institute. "Lawmakers examine prospects for carbon storage," *Environment and Energy Daily*, July 7, 2003. See also Federal Document Clearing House Congressional Testimony, July 8, 2003.

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: Sarah Forbes, sarah.forbes@netl.com, or Scott Klara, klara@netl.doe.gov.