

THE CARBON SEQUESTRATION NEWSLETTER

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

July 2004

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Sequestration in the News

U.S. Energy Secretary Speaks at Conference on U.S. Climate Policy. In his prepared remarks at the Brookings/Pew Conference – “U.S. Climate Policy: Towards a Sensible Center” – held June 24-25 in Washington D.C., Energy Secretary Spencer Abraham emphasized the Administration’s commitment to reducing greenhouse gas emissions through scientific and technological advancement. Secretary Abraham outlined DOE’s establishment of “six pillars of collaborative climate research” to meet growing future energy needs while also aggressively confronting the challenge of climate change. The pillars are: hydrogen, clean coal, safe nuclear power, fusion, energy efficiency, and renewable energy. “In the 22nd century, we will likely produce and consume energy in ways that we cannot imagine today,” said Secretary Abraham in closing. A transcript of his speech is available at http://www.doe.gov/engine/content.do?PUB-LIC_ID=16063&BT_CODE=PR_SPEECHES&TT_CODE=PRESSP EECH. For additional information about the Brookings/Pew conference, and to view archived video of conference speakers visit <http://www.brookings.edu/int/research/projects/climateconference20040624a.htm>

The Guardian, Shell Boss’ “confession” shocks industry. Ron Oxburgh, chairman of Shell stated that the threat of climate change makes him “really very worried for the planet.” He continued, “Sequestration is difficult, but if we don’t have sequestration then I see very little hope for the world,” said Lord Oxburgh. June 17, 2004, <http://www.guardian.co.uk/oil/story/0,11319,1240565,00.html> See also “Shell boss ‘fears for the planet’,” http://news.bbc.co.uk/2/hi/uk_news/3814607.stm

Exxon Head: Energy Independence Is a Myth. “We do not have the resource base to be energy independent,” Exxon Mobil chairman Lee R. Raymond said in a speech in which he outlined some of what he called the “hard truths” about global energy markets. As for global warming, Raymond expressed his skepticism about the science and predicted that in the decades ahead “carbon dioxide emissions from greater fossil fuel use will climb.” He said, “we simply do not yet have the economic solutions or technologies that would permit us to meet future energy demands without carbon emissions growth.” June 8, 2004, <http://www.charlotte.com/mld/charlotte/business/8864868.htm?1c>

New Zealand coalminer to bury gas. State-owned Solid Energy New Zealand is investing NZ\$175 million to find a way to bury unwanted carbon dioxide produced by the burning of fossil fuels. With the announcement of a carbon tax expected in 2007, it is likely coal-based energy production and electricity generation will become more expensive. “Capture and storage of carbon dioxide offers the opportunity to avoid the carbon tax and directly reduce greenhouse gas emissions to the atmosphere,” Solid Energy chief executive Don Elder said. In neighboring Australia, a survey has shown there are enough sites to bury its current carbon dioxide emissions, by compressing the gas to a near-liquid form and injecting it deep underground, for at least 1600 years. June 22, 2004, <http://www.nzherald.co.nz/storydisplay.cfm?storyID=3573903&thesection=news&thesubsection=general>

Carbon Sequestration: Can It Help Beat Back Global Climate Change? This article by the American Public Power Association provides an overview of current carbon sequestration projects and the science behind the technology. The discussion encompasses all areas of carbon sequestration (geologic, oceanic, and terrestrial) and mentions numerous commercial projects such as Weyburn and Sleipner, as well as projects/research focused on ocean and terrestrial sequestration. The article provides estimates of the costs of the various carbon capture technologies and stresses the importance of educating the public about carbon sequestration technology to prevent a similar backlash as was experienced with nuclear power technology. May/June 2004, <http://www.appanet.org/Newsroom/magazine/2004/CarbonSequestration.cfm>

Press for Weyburn. “It’s one thing to say that underground is a great place to store carbon dioxide, but it’s another thing to be able to prove it as we have done,” said Dr. Ben Rostron of the University of Alberta. “We have been able to show that you can safely capture carbon dioxide that would otherwise go back into the atmosphere, and put it back into the ground. It’s very exciting work.” June 25, 2004, http://www.eurekalert.org/pub_releases/2004-06/uoa-ucd062504.php. See also, “Greenhouse gas sequestration in abandoned oil reservoirs: The International Energy Agency Weyburn pilot project.” GSA Today, July 2004 (v. 14, no. 7, p. 4-10), <http://www.gsjournals.org/gsaonline/?request=get-current-toc&issn=1052-5173>

Green Coal to Take on Wind Power in UK. Mitsui-Babcock, one of Britain's biggest power plant engineering companies, says that if its energy-efficient boilers and turbines were applied across all 18 large coal-fired stations in the country, it could meet half the 2010 renewables target without the risks of disruption that wind and wave power present. "It would produce power equivalent to hundreds of windmills and, of course, the plant would keep working even when the wind isn't blowing," said Les King, director of technology and engineering at Japanese-owned Mitsui-Babcock. The latest technology could make coal a viable long-term source of clean energy in the government's bid to cut damaging greenhouse gases. May 30, 2004, <http://business.scotsman.com/index.cfm?id=614102004>

Announcements

New NETL Sequestration Website. The website has a new look and includes new information on accounting protocols and NETL systems, benefits and policy analysis. www.netl.doe.gov/sequestration

The following new fact sheets are available for download at the NETL website: <http://www.netl.doe.gov/coalpower/sequestration/Resources/refshelf.html>

Southeast Regional Carbon Sequestration Partnership (SERCSP)

An Integrated Modeling Framework for Carbon Management Technologies

Conceptual Design of Optimized Fossil Energy Systems with Capture and Sequestration of CO₂

Enhancing Carbon Sequestration and Reclamation of Degraded Lands with Fossil-Fuel Combustion By-Products

Carbon Sequestration Program Adds Partners. The Department of Energy announced that seven new states and 13 organizations have joined the Carbon Sequestration Regional Partnership Program. Three of the seven partnerships added new partners. June 10, 2004, <http://releases.usnewswire.com/GetRelease.asp?id=121-06102004>

Clean Coal Plant to Anchor West Virginia "Eco-Park." Secretary of Energy Spencer Abraham commissioned a new \$215 million West Virginia clean coal project based on new technology that over the next 60 months will deliver environmental improvements, economic benefits and thousands of new jobs. "The Greenbrier plant is a prime example of President Bush's commitment to coal," Secretary Abraham said. "Greenbrier will clean an existing environmental waste site, reduce emissions, deliver needed electric power at affordable rates, and produce new economic activity. It marks another step toward achieving a zero-emissions power plant and will help us meet a primary goal of the National Energy Policy – to make maximum use of our domestic energy resources while elevating environmental and economic security." June 7, 2004, available at http://www.netl.doe.gov/publications/press/press_toc.html

"Australia's Howard shies from emissions trading, CO₂ tax." As anticipated, Australia's Prime Minister John Howard unveiled an energy white paper on June 15th. It rejects calls for emissions trading or a carbon tax, introducing instead incentives and research money for renewable energies. <http://www.pointcarbon.com/article.php?articleID=3903&categoryID=147>

Science

New Version of Premier Global Climate Model Released. The National Center for Atmospheric Research (NCAR) in Boulder, Colorado has unveiled a powerful new version of a supercomputer-based system to model Earth's climate and to project global temperature rise in coming decades. The system, known as the Community Climate System Model, version 3 (CCSM3) indicates in a preliminary finding that global temperatures may rise more than the previous version had projected if societies continue to emit large quantities of carbon dioxide into the atmosphere. Press release <http://globalchange.gov/#CCSM>.

"Global change: Hydrocarbon-driven warming." This paper investigates the relationship between the release of huge amounts of hydrocarbons (1,500 to 3,000 Gigatons) during the "initial Eocene thermal maximum" (IETM), occurring about 55 million years ago, and current emissions from fossil fuels. The authors find the events at the IETM to be intriguing, but an imperfect analogue of current fossil-fuel emissions. Given the comparable estimates for carbon release at the IETM and anthropogenic release of carbon into the atmosphere over the coming centuries (estimated at 3,000–4,000 Gt), environmental change during the IETM should become the subject of general investigation. By Gerald R. Dickens, in *Nature* 429, 513 - 515 (03 June 2004).

The world's oceans possess two CLAW cycles. Dimethylsulfide (DMS) is a climatically-important trace gas that is produced by various types of marine phytoplankton and is believed to play a major role in maintaining earth's temperature within bounds conducive to the existence of life. This "CLAW" phenomenon, named for the four scientists who formulated it – Charlson, Lovelock, Andreae and Warren (Charlson et al., 1987) – has now been joined by a companion phenomenon that accomplishes the same task over the world's nutrient-poor marine waters. June 2004, <http://www.co2science.org/edit/v7/v7n24edit.htm>

Study Supports View That Ice Age Is Still Quite a Way Off. Despite the recent trend toward global warming, scientists have long wondered whether the earth was nearing another ice age – an end to the 12,000-year temperate spell in which modern civilizations arose. Some have said such a transition is overdue, given that each of Earth's three previous temperate intervals lasted only about 10,000 years. But now, in an eagerly anticipated study in the journal *Nature*, a group of climate and ice experts says it has new evidence that Earth is not even halfway through the current warm era. The evidence comes from the oldest layers of Antarctic ice ever sampled. June 9, 2004, <http://www.nytimes.com/2004/06/09/science/09CND-CLIMATE.html?ex=1087444800&en=943ce89651118b2d&ei=5062>. Original article, **Palaeoclimate: Frozen time**, by Gabrielle Walker, in *Nature*, June 10, 2004, http://www.nature.com/cgi-taf/Dynapage.taf?file=/nature/journal/v429/n6992/full/429596a_fs.html

Geology

“Can geological carbon storage be competitive?” A new working paper from CICERO reviews the literature on the costs and benefits of geological carbon storage. In the near-term, Carbon Capture and Storage (CCS) is likely only to be an economically viable option in enhanced oil recovery. In the medium and longer term, with improvements in CCS technology and the likelihood of increased greenhouse gas permit prices, CCS is likely to become an economically viable option under a wider range of circumstances. For details and download see http://www.cicero.uio.no/publications/detail.asp?publication_id=2735&lang=en

Technology

“Novel concepts for CO₂ capture.” This paper describes the possibilities for power generation with CO₂ capture using envisaged key technologies: gas turbines, membranes, and solid oxide fuel cells (SOFCs). The SOFC anode off-gas is a CO₂ rich stream, which can be used for sequestration without elaborate treatment. Several implementation schemes of the technique are discussed. By J. W. Dijkstra and D. Jansen, *Energy*, Volume 29, Issues 9-10, July-August 2004, Pages 1249-1257.

“Integration of H₂-separating membrane technology in gas turbine processes for CO₂ capture.” The paper describes the promising possibility to capture CO₂ in natural gas fired power cycles through the use of a high-temperature membrane reactor of the methane-steam reforming type with an integrated H₂-separating membrane. Two types of membranes are integrated: Palladium membranes, which could allow for zero-emission power cycles, and microporous membranes, the use of which in the present work means that 20% of the generated CO₂ is emitted to the atmosphere. By K. Jordal et al., in *Energy*, Volume 29, Issues 9-10, July-August 2004, Pages 1269-1278.

“An experimental investigation into the use of molten carbonate fuel cells to capture CO₂ from gas turbine exhaust gases.” This paper describes the conceptual design of a hybrid molten carbonate fuel cell (MCFC) system to generate power and simultaneously capture CO₂ from small (<10 MW) gas turbine exhaust streams. Initial modeling studies indicated that a 1.6 MW MCFC could reduce the CO₂ emissions from a 4.6 MW gas turbine by 50% on a per kWh basis. Initial data from investigations confirm that the fuel cell can operate at sub-optimal CO₂ levels with limited loss in power and efficiency. By A. Amorellia et al., in *Energy*, Volume 29, Issues 9-10, July-August 2004, Pages 1279-1284.

“CO₂ capture and storage – the essential bridge to the hydrogen economy.” This paper explains the key issues that may favor the hydrogen economy in the long-term, and addresses CO₂ capture options that are essential to help develop the required hydrogen infrastructure in the short-term. By D.R. Simbeck, in *Energy*, Volume 29 (2004) 1633-1641.

“Prospects for carbon capture and sequestration technologies assuming their technological learning.” This paper analyzes the potentials of carbon capture and sequestration technologies (CCS) in a set of long-term energy-economic-environmental scenarios based on alternative assumptions for technological progress of CCS. Past experience in controlling sulfur dioxide emissions (SO₂) from power plants is used as a guide for estimating technical progress. A "learning curve" for CCS, which describes the relationship between the improvement of costs due to accumulation of experience in CCS construction, is quantified. Due to the assumed technological learning, the costs of emissions reductions for CCS drop rapidly and in parallel with the massive introduction of CCS on the global scale. By Keywan Riahi et al., in *Energy*, Volume 29, Issues 9-10, July-August 2004, Pages 1309-1318.

“Geological storage of CO₂: What do we know, where are the gaps and what more needs to be done?” The aim of this paper is to present an overview of the research work that is currently underway, and to provide an analysis of the current state of knowledge on geological storage of CO₂. The analysis is broken down to address the key geological storage options: deep coal seams, depleted hydrocarbon reservoirs and deep saline aquifers. In each case, areas of uncertainty are highlighted, as well as areas where it is considered that further work will be needed so that the technology can be accepted by Governments and the general public as a mitigation option suitable for wide-scale application throughout the world. By John Gale, in *Energy*, Volume 29, Issues 9-10, July-August 2004, Pages 1329-1338.

Ocean

Can Iron-Enriched Oceans Thwart Global Warming? After adding iron to the waters around Antarctica to encourage phytoplankton blooms, Ken Buesseler, a marine chemist at the Woods Hole Oceanographic Institute in Massachusetts, summarized the results by saying, "we measured an increase in carbon flux in the iron-fertilized patch and did not see an equivalent increase in flux outside in the control stations. However, this increase was not particularly large." Despite these results Buesseler has not given up on the idea of using carbon sinks to combat climate change. "We need to explore ways to decrease inputs of carbon dioxide to the atmosphere and enhance carbon sinks," Buesseler said. "The ocean is one of the sinks and the link between the surface ocean and deep ocean with respect to these sinking particles is one of the most poorly understood areas of ocean science." June 9, 2004, http://news.nationalgeographic.com/news/2004/06/0609_040609_carbonsink.html

Terrestrial

Size Does Matter. In a side event at UNFCCC SB-20, Bernhard Schlamadinger of Joanneum Research, explained that the smaller the scale of CDM A&R projects, the greater the fluctuation of carbon stocks. Schlamadinger suggested "normal forest" operations as an option to reduce the fluctuation, but recognized that it may not be feasible for small-scale projects. For more information on this event see <http://www.iisd.ca/climate/sb20/enbots/>

Soil Carbon Sequestration Impacts on Global Climate Change and Food Security.

The amount of carbon that can be restored in the world's degraded agricultural soils will directly influence global food security and climate change within our lifetime, said Rattan Lal, director of the carbon management and sequestration center at Ohio State University. The carbon sink capacity of the world's agricultural and degraded soils is 50 to 66% of the historic carbon loss of 42 to 78 gigatons of carbon. An increase of carbon (1 ton C per ha) in degraded cropland soils may increase crop yield by 20 to 40 kilograms per hectare (kg/ha) for wheat, 10 to 20 kg/ha for maize, and 0.5 to 1 kg/ha for cowpeas. As well as enhancing food security, carbon sequestration has the potential to offset fossil fuel emissions by 0.4 to 1.2 gigatons of carbon per year, or 5 to 15% of the global fossil-fuel emissions. By R. Lal, available in *Science*, Vol 304, Issue 5677, 1623-1627, 11 June 2004.

Grand Island Independent, Senator Nelson of Nebraska hosts D.C. workshop on carbon.

Farmers being provided incentives to store carbon in the ground would provide both financial advantage and environmental benefits by addressing global warming and climate change concerns, said Sen. Ben Nelson (D-NE) at a June 9th workshop in Washington D.C. The workshop brought together a wide range of agricultural and environmental groups to look at the benefits of storing carbon in the ground, along with what role the federal government could play in developing carbon markets in the United States. June 10, 2004, http://www.theindependent.com/stories/061004/new_carbon10.shtml

Washington Times, U.S. paved surfaces would cover

Ohio. If all the paved surfaces in the 48 contiguous United States were pieced together, they would almost cover the state of Ohio. That is the result of a study by the National Oceanic and Atmospheric Administration's National Geophysical Data Center of the highways, streets, buildings, parking lots and other solid structures in the country. The replacement of heavily vegetated areas by impervious surface areas reduces sequestration of carbon, which plants absorb from the atmosphere, the researchers said. June 14, 2004, <http://washingtontimes.com/upi-breaking/20040614-102351-1406r.htm>

Public-Private Partnership Addresses Climate Change and Restores Critical Habitat.

Cinergy Corp., the Kentucky Department of Fish and Wildlife Resources, Environmental Synergy Inc., and The Conservation Fund are joining forces to create a market-based conservation solution that will offset the environmental impacts of greenhouse gasses, provide new fish and wildlife habitat, and bring recreation-driven economic benefits to Kentucky. "Carbon sequestration may well become one of the most important tools that we have for the recovery and management of imperiled species. It's a win-win situation for wildlife and people when land is restored and reforested. The added benefit of public access to these lands is remarkable," said Commissioner Tom Bennett of the Kentucky Department of Fish and Wildlife Resources. May 28, 2004, http://home.businesswire.com/portal/site/google/index.jsp?ndmViewId=news_view&newsId=20040528005243&newsLang=en

Trading

Japanese utility to purchase GHG emissions credits.

Natsource announced that Chugoku Electric Power Co., Inc, a Japanese electric utility, has agreed to purchase 3.6 million tonnes of greenhouse gas (GHG) emission reductions through Natsource's greenhouse gas credit aggregation pool (GG-CAP). The GG-CAP will contract for and manage delivery of low cost, high quality greenhouse gas emission reductions usable for compliance against emissions limitations in the 2005-2012 period. In a statement released in Japan, Chugoku said it plans to pay US\$17 million for the emissions credits, implying a price of US\$4.72 per tonne. June 1, 2004, <http://www.pointcarbon.com/article.php?articleID=3813&categoryID=147>

Greenhouse gas trade heats up. The prospect that Russia may ratify the Kyoto Protocol is triggering some large-scale trading in emission credits by companies and countries seeking to limit the financial impact of future government restrictions on industrial emissions of carbon dioxide and other greenhouse gases. "People are beginning to assess that they may have some risks," said Ken Newcombe, who manages six funds for the World Bank that are involved in emissions trading. Wall Street Journal, June 2, 2004 <http://afr.com/articles/2004/06/01/1086058850473.html>

Most UK companies will fail to meet CO₂ emissions regulation deadline.

54 percent of UK companies could face penalties running into millions of euros because they will not be ready in time to comply with new EU regulations on CO₂ reduction. According to a European study by LogicaCMG, one in five UK companies have yet to start the process of moving towards compliance with the EU Emissions Trading Scheme (ETS) which has a deadline of January 1, 2005. June 2, 2004, <http://www.pointcarbon.com/article.php?articleID=3817&categoryID=147>

Policy

Action on Kyoto: Indonesia ratifies Kyoto Protocol.

The Indonesian Parliament has approved a bill ratifying the Kyoto Protocol. The country will have formally ratified the protocol once the President signs the bill. June 24, 2004, <http://www.pointcarbon.com/article.php?articleID=3964&categoryID=279> (subscription required). **Algeria stops short of ratifying.** Algeria will not formally ratify the Protocol unless it enters into force. This is potentially a very significant event, as it would make Algeria the first OPEC country to ratify the protocol. June 28, 2004, <http://www.pointcarbon.com/article.php?articleID=3991&categoryID=279> (subscription required).

Indiana Business and Farm Lobbyists Opposes GHG Bill.

Indiana business and farm lobbyists joined forces to oppose the federal McCain-Lieberman bill designed to curb global warming by capping greenhouse gas emissions at 2000 levels. The Indiana Chamber of Commerce and Indiana Farm Bureau argue the bill could cost Indiana families as much as \$1,500 and cause as many as 9,000 lost jobs in 2010, according to a recent economic study. Environmentalists disagreed with the study as an example of one-dimensional thinking that ignores the economic benefits of alternative energy sources and investments in energy efficiency. June 16, 2004, <http://www.pointcarbon.com/article.php?articleID=3911&categoryID=147>

Sequestration in the News Cont'd

EPA Says Millions Are Inhaling Too-Sooty Air. Ninety-nine million Americans are breathing unhealthful air that can cause respiratory problems and even premature death, according to assessments released by the Environmental Protection Agency. The agency identified 243 counties throughout the country that fail to meet national air standards for fine-particle pollution – mainly soot. Once the rulemaking process is complete, state and local officials will have to devise plans to reduce the pollution. States now have three months to respond before the agency issues a final rule in November. EPA Administrator Mike Leavitt said the announcement was "about getting our air cleaner and our standards getting tougher." June 29, 2004, <http://www.washingtonpost.com/wp-dyn/articles/A15929-2004Jun29.html>

Japanese Firms Must Report CO₂ Emissions. The Japanese Environment Ministry decided Friday to make it compulsory for commercial premises over a certain size to submit reports on how much carbon dioxide they produce. Proprietors of offices and shops will have to calculate how much carbon dioxide their businesses have produced on the basis of how much electricity and fuel they have consumed, and report the total to the central and local governments. The central government will add up the carbon dioxide emission totals and publish a national tally. The aim of the measure is to pressure major producers of CO₂ to reduce their emissions of the gas. June 7, 2004, <http://www.pointcarbon.com/article.php?articleID=3845&categoryID=147>

Events

August 10-11, 2004, **The 2004 Nebraska Grazing Conference**, Kearney, Nebraska. Provides a forum for the discussion of grazing strategies and management. Topics and presenters include, "Carbon Sequestration in the Great Plains," Martin Kleinschmit, Center for Rural Affairs and a Nebraska farmer. For more information, contact the Center for Grassland Studies by phone (402) 472-4101, e-mail grassland@unl.edu or access information and a registration form online at www.grassland.unl.edu

August 9-13, 2004, **24th Annual ESRI International User Conference**, San Diego Convention Center, San Diego, California. Register by **July 9, 2004**. For the current conference agenda, visit www.esri.com/uc. For registration questions, contact ESRI at 909-793-2853, extension 1-1363, or ucregis@esri.com.

August 20-28 2004, **32nd International Geological Congress. Including Topical Symposium T09 – Future of Energy and Resources** Florence, Italy. Contacts: Scientific Secretariat, Chiara Manetti, Borgo Albizi, 28 - 50121 Firenze, Italy. Tel/Fax: +39 055 2382146 casaitalia@geo.unifi.it Organizing Secretariat, Newtowns, Via Augusto Righi, 8 50019 Sesto F.no - Firenze, Italy Tel: +39 055 33611 Fax: +39 055 3361250/350 secretariat@32igc.org www.32igc.org

Events Cont'd

September 5-9, 2004, **7th International Conference on Greenhouse Gas Control Technologies**, Vancouver BC, Canada. GHGT-7 is being organized by University of Regina, Natural Resources Canada, and the IEA GHG R&D Programme. www.ghgt7.ca. Contact: GHGT-7 Conference Secretariat, Ted Morris, Suite 150, 10 Research Drive, Regina, SK. S4S 7J7, Canada. Tel: +1 306 337 2290 Fax: +1 306 337 2301 secretariat@ghgt7.ca

September 13-17, 2004, **The International Pittsburgh Coal Conference**, Osaka Japan. Industrial Ecology topics include: life cycle studies of coal conversion plants; Industrial ecology of emission trading; and planning future energy plants. <http://www.engr.pitt.edu/pcc> Topics: <http://www.engr.pitt.edu/pcc/04AbstractTopics.htm>

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

November 7-12, 2004, **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>

January 16-20, 2005, **Chapman Conference on the Science and Technology of Carbon Sequestration**, Bahia Resort Hotel, San Diego, CA. The goal of this conference is to bring together scientists, engineers, and others who study long-term sequestration of carbon as a way of reducing potential global warming. For more information see <http://www.agu.org/meetings/cc05acall.html>

Recent Publications

Energy, Special Issue. A special issue of *Energy* dedicated to the 6th International Conference on Greenhouse Gas Control Technologies (GHGT-6), held in Kyoto, Japan in October 2002, is now available (Volume 29, Issues 9-10, July-August 2004). Over 300 papers were submitted to the conference and more than 500 delegates attended. A selection of papers are collected in this journal, some are highlighted in the Technology section.

Scaled-Down Climate Change Bill Has Lower Costs, Smaller Emissions Cuts. Changes made by Sens. John McCain (R-AZ) and Joseph Lieberman (D-CT) to scale down their climate change legislation have reduced the costs of the measure, but have also reduced its impact on U.S. greenhouse gas emissions, the Energy Information Administration said in a report released June 8th entitled, "Analysis of Senate Amendment 2028, the Climate Stewardship Act of 2003." The report is available on the EIA website at http://www.eia.doe.gov/oiaf/analysispaper/sacsa/pdf/s139amend_analysis.pdf

Recent Publication Cont'd

Summary available of the twentieth sessions of the Subsidiary Bodies (SB-20) to the UN Framework Convention on Climate Change (UNFCCC), which took place at the Maritim Hotel in Bonn, Germany, from June 16-25, 2004. Approximately 1,350 participants from 161 governments, one observer State, and 134 intergovernmental, non-governmental, and other observer organizations and media outlets were in attendance. See *Earth Negotiations Bulletin*, June 28, 2004 for more details. Available at <http://www.iisd.ca/climate/sb20/>

Pew Center reports available for download. "Unfortunately, we're already past the point where climate change can be prevented entirely," said Eileen Claussen, President of the Pew Center on Global Climate Change. "Now we need a two-pronged approach that combines reductions in greenhouse gas emissions with policies that will help us adapt to the climate change that is going to occur." [Coping with Global Climate Change: The Role of Adaptation in the United States](#), discusses the importance of adapting to climate change, the options available for adaptation, and the challenges of implementing them in the United States. June 15, 2004, http://www.pewclimate.org/press_room/sub_press_room/adaptation.cfm
Other Pew Center reports that address market and non-market impacts from climate change are: [A Synthesis of Potential Climate Change Impacts on the United States](#) and [U.S. Market Consequences of Global Climate Change](#). http://www.pewclimate.org/press_room/sub_press_room/28apr04.cfm

CO₂ sequestration in Ontario, Canada. This paper evaluates the potential for reservoirs in Canada to store CO₂. Two different major reservoirs with approximate storage capacities of 289 million and 442 million tonnes are identified in southwestern Ontario for CO₂ sequestration, one located in the southern part of Lake Huron and the other located inside Lake Erie. These reservoirs could contain approximately 14–21 years of CO₂ emissions from a nearby coal-fired power generation unit having a total generation capacity of about 4000 MW. By A. Shafeen et al., in *Energy Conversion and Management*, Volume 45, Issue 17, October 2004, Pages 2645-2659. <http://www.sciencedirect.com/science/article/B6V2P-4C4BH5J-1/1/97a1b3101906f775f047261c8564e03e>

"Beyond Kyoto." "Business, in particular, is accustomed to making decisions in conditions of considerable uncertainty, applying its experience and skills to areas of activity where much is unknown. That is why it will have a vital role in meeting the challenge of climate change – and why the contribution it is already making is so encouraging," says Lord John Browne, CEO of BP, in an upcoming article in *Foreign Affairs* (July/August 2004, Volume 83, No. 4, pgs. 20-32). In this article Browne offers his business perspective on the question of CO₂ emissions.

Legislative Activity

Connecticut Climate Change Act Enters into Force. Connecticut's anti-global warming act came into effect on June 16. The Act calls for lowering greenhouse gases to 1990 levels by 2010 and to reduce emissions 85 percent by 2050. June 16, 2004, <http://www.pointcarbon.com/article.php?articleID=3912&categoryID=147>

Main ushers in climate emissions reporting. On June 17th, the Board of Environmental Protection in Maine approved the first of many rules expected in an ongoing effort to reduce greenhouse gas emissions across the state. The new rule requires paper mills, power plants, and factories to report their greenhouse gas emissions to the state Department of Environmental Protection beginning on July 1, 2005. The information could be used to implement measures to curb emissions, such as an emissions trading scheme. Though the federal government does require reporting of air pollutants, only a handful of states require that businesses track greenhouse gases. June 21, 2004, <http://www.pointcarbon.com/article.php?articleID=3940&categoryID=147>

USA's Northeast States Developing a Regional GHG Emissions Trading System. The Regional Greenhouse Gas Initiative (RGGI), is progressing towards establishment of a multi-state GHG cap-and-trade emissions market in the Northeastern and Mid-Atlantic states. The proposed program, which will require electric power generators in participating states to reduce carbon dioxide emissions, is planned to be designed by April 2005. Global Clean Energy and Climate Change Newsletter, June 8, 2004, <http://www.bakernet.com/newsletters/Article.asp?ArticleID=3959&EditionID=457&URL=%2Fnewsletters%2Fnewsletter%2Easp&NLID=34>