



May 17, 2009

## *Sequestration News*

The Waxman-Markey House climate bill (now HR 2454) was introduced on May 15 and goes to markup Monday (May 18). It is 900 pages long and has several provisions important to coal and CCS (as noted below), including funding for CCS via allowance sales. A key will be whether the funding is adequate on a project basis, and whether the timing is reasonable. The bill can be downloaded from the House Energy and Commerce Committee's web page (a link is provided below). Compromise was reported on a number of items, and there are significant provisions for funding CCS projects (Sections 114, 115, 782(f)). Performance standards were retained for one source category: coal-fired power plants (Section 116).

Senator Bingaman introduced S.1013, a bill to address liability associated with CCS projects. Senator Bingaman also is pursuing general energy legislation, including a Renewable Energy Standard for electricity sellers. Similar legislation is contained in the House climate bill (HR 2454).

The EPA endangerment finding with regard to CCS continues to be a topic of discussion.

NETL published a report on potential CO<sub>2</sub> storage capacity below Federal lands (mostly in the West).

The Department of Energy (DOE) announced on May 15 that \$2.4 billion from the Stimulus Bill (ARRA) will be used to accelerate commercial deployment of CCS technology: <http://www.energy.gov/> and [http://energy.senate.gov/public/index.cfm?FuseAction=PressReleases.Detail&PressRelease\\_id=f9312be1-9837-45f7-8536-bd4b122e195b&Month=5&Year=2009&Party=0](http://energy.senate.gov/public/index.cfm?FuseAction=PressReleases.Detail&PressRelease_id=f9312be1-9837-45f7-8536-bd4b122e195b&Month=5&Year=2009&Party=0)

A report published in the latest issue of the journal *Nature*, by Stuart Gilfillan at the University of Edinburgh's Scottish Centre for Carbon Storage, concluded that long term storage of CO<sub>2</sub> storage should not be a problem when properly done. "We looked at nine CO<sub>2</sub> fields, ranging from 10,000 years to about 42 million years old, and they have all stored CO<sub>2</sub> for this length of time without obvious leakage signs," Gilfillan told Agence France-Presse.

### *Waxman-Markey (W-M) Climate Bill*

The Waxman-Markey draft climate bill tops the news for energy/environmental issues. The bill is running behind the schedule originally announced by Committee Chairman Waxman, but progress was announced on broad fronts during the week of May 11, and markup is scheduled before the full Energy and Commerce Committee beginning May 18. The Committee posted on its website compromise positions on several issues, including the Renewable Energy Standard (RES) and allowance allocation for automakers and energy intensive industries: <http://energycommerce.house.gov/>. The bottom line on the RES is that, if a governor requests relief from the default standards, utilities in that state will be

required to meet a 12% renewables threshold by 2020, along with demand reductions via efficiency of 8% (essentially a 20% renewable energy/efficiency standard by 2020). The deal reached on allowance allocations (worth approximately \$100 billion per year in the early years of the C&T program) is to allocate 35% to the electricity sector (phased out by 2030), 9% to natural gas local distribution companies, 1.5% to residential consumers of heating oil or propane, 15% to low/moderate income households to offset higher energy costs, 15% for “trade exposed” industries, 2% for refiners, **2% from 2014 thru 2017 and 5% in 2018 and later years for CCS at power plants**, 1% to “clean energy innovation centers”, 10% to States, and the remainder for a number of causes including funding reductions in overseas deforestation, funding other international emission reductions and international adaptation. The emission cap in 2020, originally a 20% reduction from 2005 emission rates, was reduced to 17%. **A redraft of the bill was formally introduced by Chairman Waxman on May 15 as HR 2454.**

[http://energycommerce.house.gov/index.php?option=com\\_content&view=article&id=1622:chairmen-waxman-and-markey-introduce-the-american-clean-energy-and-security-act&catid=155:statements&Itemid=81](http://energycommerce.house.gov/index.php?option=com_content&view=article&id=1622:chairmen-waxman-and-markey-introduce-the-american-clean-energy-and-security-act&catid=155:statements&Itemid=81) There are no announced changes in the bill’s approach to cost containment (such as a Bingaman-like “safety valve” on allowance prices) or on the controversial expansion of citizen suit rights under the initial draft.

Republicans reportedly have amassed over 200 amendments to offer during next week’s markup. However, some view the allocation of a large share of allowances to utilities as the major negotiating card available to Congressman Waxman to win additional support for the bill. The fact that he played that card likely suggests that he believes he has sufficient votes to move the bill out of committee.

### *CCS Related Senate Activity*

On May 7, Senator Bingaman introduced S.1013, a bill to promote the development and deployment of CCS technology. The bill had 9 (mostly coal state) cosponsors. A hearing was held on May 14, at which DOE (Acting Assistant Secretary Vic Der) testified. The bill supported up to 10 additional demonstration projects. It provided limited liability indemnification for projects in the period 10 years after CO<sub>2</sub> plume pressure equilibrium, with the cost offset by a fee-per-ton on injected CO<sub>2</sub>. In contrast, the IOGCC had recommended a liability scheme in which the “handoff” to federal monitors occurred 10 years after injection ceased. The bill would also authorize the siting of CO<sub>2</sub> storage projects on Federal land. Others testifying included Chiara Trabucchi, who has published papers on liability issues associated with CCS. Testimony and an archived video are available at:

[http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing\\_ID=1d120df3-d757-96c3-28bc-f67b62a58ee6](http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=1d120df3-d757-96c3-28bc-f67b62a58ee6) .

The Senate is awaiting completion of House action prior to tackling climate change legislation, but is moving on energy legislation in the Energy and Natural Resources Committee chaired by Senator Bingaman. The key feature is a RES, similar to the one in the House climate change bill. Bingaman has resisted recommendations by other Senators to treat coal w/CCS as counting toward a RES.

### *EPA and CCS*

Some commotion was developed last week when a nine page paper leaked from within the Administration regarding EPA’s proposed Endangerment Finding (comment period closes June 23). The unsigned document criticized the Administrator’s proposed finding of health impacts from climate change. One argument posed was that the health effects cited in the proposed rule did not meet reasonable standards of probability and were based primarily upon a “precautionary principle,” that

tended to expand the threshold for establishing “endangerment.” The document also criticized EPA’s definition of chemicals not emitted by the source category under consideration for regulation (mobile sources) as climate related “air pollution.” The effective result of this approach would appear to be to charge the transportation sector with responsibility for pollutants it does not emit and cannot control. Conversely, EPA did not define precursors to tropospheric ozone as climate air pollutants, even though they are emitted primarily from transportation sources and TO is a strong GHG. So far the response has focused more on the commenter’s background, than the substance of the comments. The response, in turn, generated a May 13 letter from Senator Barrasso to EPA and OMB management, challenging them to justify the focus on the commenter, rather than the comments.

On March 5, EPA proposed regulations for hazardous air pollutant emissions from Reciprocating Internal Combustion Engines (RICE). The rules are significant to large coal users because they reflect one of the first rulemakings by EPA since their previous approach to regulating (or more accurately, not regulating) emissions during startup, shutdown, and malfunctions was rejected by a court decision. This may have bearing on future CCS actions by EPA.

### **General CCS Related News**

The *NYTimes* reported April 17 that SCS Energy has proposed to build a coal-fired power plant near New York City, capture the CO<sub>2</sub>, and inject it in a saline reservoir 70 miles off the coast of New Jersey, a mile below the seabed: <http://www.nytimes.com/2009/04/18/business/energy-environment/18clean.html>

*Energy and Environment News (May 14)* reported on an article in *Science* (May 15 issue) that concluded that if the West Antarctic ice sheet melts, the resulting rise in sea level would be about one-half previous estimates.

The IRS published “Notices” containing directions for applying for tax credits for advanced coal technologies pursuant to additional funding provided in P.L. 110-343 (the 2008 Economic “Bailout” legislation). [http://www.irs.gov/irb/2009-16\\_irb/ar06.html](http://www.irs.gov/irb/2009-16_irb/ar06.html) and [http://www.irs.gov/irb/2009-16\\_irb/ar07.html](http://www.irs.gov/irb/2009-16_irb/ar07.html)

On April 20, the Deloitte Center for Energy Solutions announced results of a survey of energy regulators regarding cleaner energy sources. Views of PUC respondents were mixed regarding CCS technology: “only 25.4 percent felt it was “extremely effective,” while an almost identical amount (23.7 percent) view it as “not effective at all.”

[http://www.deloitte.com/dtt/press\\_release/0,1014,sid%253D2283%2526cid%253D258524,00.html?wt.mc\\_id=Pusid](http://www.deloitte.com/dtt/press_release/0,1014,sid%253D2283%2526cid%253D258524,00.html?wt.mc_id=Pusid)

CBO has published a report concluding that ethanol production contributed to higher food prices in the U.S., while reducing GHG emissions. The report also indicated that it did not include the negative GHG impacts of land clearing associated with the increased corn production for ethanol.

<http://www.cbo.gov/>

### **India & CCS**

The Electric Power Development Co., better known as J-Power, plans to advance construction of advanced coal-based thermal power plants in Asia. The in-coming corporate President said that "J-Power has the most efficient clean-coal thermal power plant technology in the world...If we transfer the technology to developing countries expanding power demand, we could contribute greatly to preventing global warming." J-Power has specific plans to build advanced coal thermal power plants in

Indonesia and India, he said. If coal thermal power plants in the United States, China and India are replaced with more sophisticated ones, annual carbon dioxide emissions could be reduced by some 1.3 billion tons, close to Japan's annual total emissions, J-Power officials said.

<http://search.japantimes.co.jp/cgi-bin/nb20090425a7.html>

## China & CCS

On May 14, Yvo de Boer, chief of the UN Climate Change Office complimented developing nations, and China, for their initiatives related to climate change mitigation. He declared that rich nations should come to the Copenhagen meeting in December with near-term emission reduction commitments, and money to pay for further reductions by nations that are not rich:

<http://www.eenews.net/climatewire/2009/05/15/3/> The announcement echoed an interview with Denmark's climate and energy minister (Connie Hedegaard), and reported by *Energy and Environment News* on May 7. Hedegaard was cited stating, "We must have truly additional financing on the table very soon."

Dr. Paul Krugman, Nobel Prize recipient (economics), NYTimes columnist, and Princeton Professor, authored a March 14 OpEd in the NYTimes addressing the difficult issue of China's participation in mitigating climate change. The Times also recently ran a very positive article noting how much China is doing in controlling its coal-fired power sector compared to the US (mainly building new supercritical pulverized coal systems). Dr. Krugman, however, concludes that "the planet can't handle the strain" of China's current energy program, and that the US will be "morally empowered" to impose trade restrictions on China if the country fails to control its GHG emissions.

The top climate change official for the People's Republic of China rejected a proposal by the U.S. to impose tariffs on imports from countries that do not impose meaningful limits on carbon emissions. China suggested that the U.S. idea is an excuse for trade protectionism even as China boosts efforts to tackle greenhouse gases. Xie Zhenhua, head of China's climate change and coordinating committee, accused the U.S. of protectionism in March while on a visit to Washington. "Climate change and imposing carbon taxes on imports ... are two separate issues" and should be tackled in separate negotiating forums, he said. Xie, vice-minister of the National Development and Reform Commission (NDRC), was speaking at the Carnegie Endowment for International Peace, a Washington think tank. Xie, who said he had talks with Chu and other U.S. officials, refuted the premise that China was slow in tackling greenhouse gases emissions. "China is not a country that does nothing," he said. "On the contrary, we have done a lot." He listed a set of market-based measures on pricing, taxes and financial incentives the country was using to cut its emissions. Minister of Science and Technology Wan Gang said the focus on environmental solutions in industry would also be one way to face up to the global economic slowdown. "The fundamental way out of the economic crisis is to find major breakthroughs in technological innovation as an important measure to create new market demand, and nurture new economic growth toward that direction," Wan said at the opening of a high-level forum for energy efficiency and emissions reduction in Beijing. More than 200 enterprises and institutions worldwide presented their latest findings and technologies at the five-day fair. The country will continue to push research in energy-saving and renewable energy technology, as well as implement more effective policies to support the development of an environmentally-friendly society, Wan said.

<http://www.chinadaily.com>

And in a related story, Tung Chee-hwa, vice chairman of the Chinese People's Political Consultative Conference told an audience at New York University on April 21, 2009 that the U.S. should be wary of invoking a carbon border tax. He said that a bill now before the U.S. Congress "smells of protectionism,"

according to a report in *The Financial Times*. He warned it could lead to retaliation from developing countries. Tung said if the program moves forward it could be challenged through the WTO. (*Energy Central*, April 22)

The Chinese government is for the first time considering setting targets for carbon emissions, according to a story in the *Guardian*. Su Wei, a leading figure amongst China's climate change negotiators, said that officials were considering introducing a national target that would limit emissions relative to economic growth in the country's next five-year plan from 2011. A second government adviser, Hu Angang, has said China should start cutting overall emissions from 2020. Hu, an influential economist and advocate of a "green revolution", is pressing the government to take a leadership role in Copenhagen by making a public commitment to reduce emissions, and last week submitted the proposal to set a new carbon dioxide goal. He is one of an elite body that advised the premier, Wen Jiabao, to include ambitious targets of a 20% improvement in energy efficiency and 10% reduction of pollution in the 2006-2010 plan. With government figures suggesting the country is on course to approach or exceed those goals, Hu suggests they be extended for the next plan with the addition of the carbon dioxide target. If his proposal is accepted, Hu believes China will be able to make an international pledge this year to reduce carbon dioxide emissions from 2020. His views are several steps beyond the negotiating position of the government and officials on the national development and reform commission (NDRC) are cautious even about goals for energy efficiency. Su Wei was doubtful about Hu's suggestion that China's carbon emissions could start to go down after 2020. While Hu's views are in the minority and final decisions are some way off, the proposals are striking because they are at odds with China's official negotiating stance. <http://www.guardian.co.uk/world/2009/apr/19/china-environment-kyoto>

### **Australia & CCS**

Nick Otter reported at the May Sequestration Conference in Pittsburgh that Australia is launching a \$100 million CCS technology initiative at the Global Carbon Capture and Storage Institute (GCCSI). Private sector participants include EPRI, Chevron, Shell Oil, BP, Exxon/Mobil Australia, and Woodside Petroleum.

It has also been reported that, under a memorandum of understanding signed by General Electric International and the Australian government, GE is becoming a founding member of the GCCSI. [http://www.businesswire.com/portal/site/moreover/index.jsp?ndmViewId=news\\_view&ndmConfigId=1000027&newsId=20090416005568&newsLang=en](http://www.businesswire.com/portal/site/moreover/index.jsp?ndmViewId=news_view&ndmConfigId=1000027&newsId=20090416005568&newsLang=en)

Alstom is also supporting the launch. The Institute is currently headed by Alstom's director of technology and external affairs, Nick Otter as interim CEO. <http://www.pacetoday.com.au/Article/Alstom-supports-Carbon-Capture-and-Storage-Institute-as-founder/477201.asp>

### **EU Countries & CCS**

A report published in the latest issue of the journal *Nature* by Stuart Gilfillan at the University of Edinburgh's Scottish Centre for Carbon Storage, Barbara Sherwood Lollar of the University of Toronto and Chris Ballentine of the University of Manchester, looks at naturally occurring CO<sub>2</sub> sinks in North America, China and Europe to identify if CO<sub>2</sub> is leaking from these sinks, as a way of determining if sequestration can be proven as a successful way to store GHGs. The team explored the ratio of isotopes of CO<sub>2</sub> and isotopes of other inert gases, like helium and neon, and found that CO<sub>2</sub> dissolves in

groundwater and doesn't resurface into the atmosphere. "We looked at nine CO<sub>2</sub> fields, ranging from 10,000 years to about 42 million years old, and they have all stored CO<sub>2</sub> for this length of time without obvious leakage signs," Gilfillan told Agence France-Presse. "Basically, if you store it in the right location, the CO<sub>2</sub> should be contained on that sort of time scale."

<http://www.greenbiz.com/news/2009/04/06/new-research-boost-clean-coal>

The UK government, as part of its new climate policy and budget, pledged not to allow any new coal plants unless a substantial of their carbon dioxide emissions are buried underground. Ed Miliband, Secretary for energy and climate change said the new policy balanced three challenges: the need to ensure the security of the UK's energy supply, the need to build a low-carbon economy and the need to slash greenhouse gas emissions. He said, "There is no alternative to CCS if we are serious about fighting climate change and retaining a diverse mix of energy sources for our economy." With these announcements, the UK committed to major near-term cuts - 34% by 2020, relative to 1990. Miliband imposed a new requirement that any new coal plant would be forced to demonstrate CCS from the start, with emissions equivalent to 300 MW being trapped. He abandoned a previous proposal of allowing plants to be "CCS-ready". As part of this announcement, the UK government has committed to funding four CCS demonstrations (see the item on the budget in section 3, climate policy – below). Funding would come from a feed-in tariff or a fixed price for the CO<sub>2</sub> trapped.

<http://www.guardian.co.uk/environment/2009/apr/23/carbon-capture-plans>

Finnish power utility Fortum and PGE Belchatow Power Plant, a subsidiary of Polish energy company PGE, have signed an agreement, under which both the companies will start co-operation in CCS. Both Fortum and PGE have their own development projects on-going, which are aiming for the CCS demonstration program of the European Commission. Fortum aims at starting a CCS demonstration project jointly with Teollisuuden Voima (TVO) at the Finnish Meri-Pori power plant. The Meri-Pori plant has a power generation capacity of 565 MW. It is jointly owned by Fortum and TVO.

<http://www.pennenergy.com/index/articles/display/359949/s-articles/s-power-engineering/s-industry-news/s-fortum-pge-belchatow-sign-co-operation-deal-in-ccs-technologies.html>

Scottish Power plans to demonstrate a fully operational CCS system by 2014 through retrofitting CCS technology to the existing coal plant at Longannet. Scottish Power, part of Iberdrola - already a world leader in wind power - has committed to make the UK its global center of excellence for CCS development, maximizing the benefits for UK jobs and skills. (*Energy Central*, April 24)

Bloomberg reports that citizens of a Dutch town are opposing a government-backed project to take CO<sub>2</sub> from a refinery hydrogen production facility near Rotterdam, and inject it in depleted natural gas fields.

<http://www.bloomberg.com/apps/news?pid=20601109&sid=agmq9zHTafTM&refer=home>

The UK became the first country in the world to bind itself to an ambitious long-term framework to limit its greenhouse gas emissions. Announcing the UK's first three 'carbon budgets' alongside his fiscal Budget, the Chancellor also set out new measures designed to help low carbon industries capitalize on the opportunities presented by the UK's legally binding target to cut greenhouse gas emissions to at least 80% below 1990 levels by 2050. The Chancellor announced:

- Legally binding carbon budgets for the first three five-year periods 2008-2012, 2013-2017 and 2018-2022.
- A revised target to reduce emissions to at least 34% below 1990 emissions by 2018-22.
- Aim to meet the carbon budgets announced today through domestic action alone, and consistent with this, setting a zero limit in the non-traded sector on offsetting through international credits for the first budget period.

- Commitment to tighten the budget after Copenhagen this December, once a global climate change agreement exists.

The UK's carbon budgets will be met through collective action across Government. All departments will be involved in delivering the carbon budgets, through formulating policies to reduce emissions and through reducing emissions from the public sector estate. Key departments and the Devolved Administrations will work with DECC to set out our proposals and policies for meeting these carbon budgets. The British Government has set this approach out in the document: "Investing in a Low Carbon Britain" [http://www.decc.gov.uk/en/content/cms/news/090423\\_low\\_car/090423\\_low\\_car.aspx](http://www.decc.gov.uk/en/content/cms/news/090423_low_car/090423_low_car.aspx)

The Chancellor also identified plans to low carbon industries ranging from energy efficiency and renewables through to CCS. The new budget will provide more than 1.4 billion additional British pounds of targeted support in the low carbon sector. These measures together with announcements made since last fall will direct an additional 10.4 billion British pounds toward low carbon investment over the next three years as follows:

- CARBON CAPTURE AND STORAGE: Plans to fund up to four CCS demonstration projects to help drive this technology to commercial viability.
- SUPPORT FOR ENERGY COMPANIES THROUGH THE CREDIT CRUNCH: UK renewable and energy projects stand to benefit from up to 4 billion British pounds of new capital from the European Investment Bank (EIB) through direct lending to energy projects and intermediated lending to banks.
- RENEWABLES AND LOW CARBON INDUSTRIES: The government will review support for offshore wind under the Renewables Obligation (RO). If the review confirms the need for additional incentives, they propose to provide even more incentive to offshore wind in the form of two renewable obligation certificates (ROCs). Other measures are also being proposed as the UK lags most of Western Europe in deploying renewable energy technologies.
- ENERGY EFFICIENCY: The government will make additional investments to achieve a step change in the energy efficiency of schools, hospitals and other public sector organizations.
- OIL AND GAS: Oil and gas remain important parts of Britain's energy mix. The Government will be introducing a "Field Allowance" for new small and technically-challenged oil and gas fields which should encourage continued investment in the UK Continental Shelf. (*Energy Central*, April 23)



*The U.S. Carbon Sequestration Council ([www.uscsc.org](http://www.uscsc.org)) is a not-for-profit, 501(c)(3), organization established as an authoritative source of information to inform and to educate on all matters pertaining to carbon sequestration.*

