



# UNITED Carbon Sequestration Council STATES

August 30, 2009

## Sequestration News

Congress is on recess and will reconvene September 8. There is continuing pressure on the U.S. Senate to adopt some sort of climate bill. Senate staffers appear to be working feverishly during the recess to prepare legislative proposals. EPA also appears to be pressing hard to complete regulatory initiatives that would mandate green house gas limits if Congress fails to reach an agreement. Two relevant rules are now at OMB (including the motor vehicle limits that would trigger power plant permitting requirements for CO<sub>2</sub> controls). There are rumors that EPA is working on completing the endangerment finding and NSPS rules (which could impact existing sources as well as new sources). When the motor vehicle standards are adopted, new power plants (and presumably other source categories) will be required to conduct a “Best Available Control Technology” (BACT) analysis as part of their PSD permit. The big international story for climate change in 2009 is the Copenhagen meeting this December. The upcoming Copenhagen meeting has created a flurry of international activity. The U.S. appears intent on taking definitive action.

### ***H.R. 2454 (House Climate Bill)***

*Reuters* reported (August 25) that the Administration’s budget updates includes “\$627 billion in revenue between 2012 and 2019” from a cap-and-trade climate change regulatory program. Some proposed climate legislation, like HR2454, provides for a portion of allowances to be auctioned and for the proceeds to go to the US Treasury. <http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE57O5MO20090825>

On August 6, the National Rural Electric Cooperative Association wrote Sen. Boxer and urged her to make changes in H.R. 2454 as it is considered by her committee in the Senate. The changes were mostly measures that would reduce the cost of the bill, and included less stringent emission caps during the first 15 years of the bill, a fully carbon-based allocation formula for distributing allowances to local distribution companies, a safety valve on allowance prices, improved mechanisms to promote use of domestic and international offsets, and significant incentives for technology development (including CCS, plug-in hybrids, nuclear, and renewables). [http://www.nreca.org/main/NRECA/PublicPolicy/issuespotlight/20090807\\_SenBoxer.htm](http://www.nreca.org/main/NRECA/PublicPolicy/issuespotlight/20090807_SenBoxer.htm)

On August 12, the National Manufacturers Association released data from a study of H.R. 2454 conducted for them by SAIC (using USDOE/EIA’s NEMS model). The study concluded that the climate bill would result in loss of 2.4 million jobs in 2030, and a 50% increase in electricity prices by 2030. EIA had

published similar results, but only under the Agency's "worst case" scenario, which included no availability of international offsets and high costs for low emission electricity technologies. Portions of the analysis are posted on the NAM website, but the full report is not yet available.

<http://www.nam.org/NewsFromtheNAM.aspx?DID={93806330-D536-46CB-AA5F-82D64D8AD6FA}>

### **OMB and CCS**

Two key Climate Change rules are now at OMB for the interagency review process. The first, received by OMB on August 18, is a final rule to establish broad reporting requirements for GHGs. The second, received by OMB on August 25, is the Proposed Rule to limit GHG emissions from light-duty vehicles. This second rule, when promulgated, will definitively establish that GHGs are regulated pollutants under the Clean Air Act. Combined with the "endangerment finding", the vehicle rule will then set in motion requirements for control of GHGs from other sectors, such as new power plants, pursuant to new source review regulations. Additional rules related to Climate Change are expected to move to OMB over the next few weeks. It is anticipated that these stars could all align, resulting in regulation of new stationary sources, by March 2010. EPA may also elect to initiate rules that would address major existing sources of GHGs. Information on rules at OMB for review can be found at [www.reginfo.gov](http://www.reginfo.gov).

### **EPA and CCS**

EPA has issued a Notice of Data Availability (NODA) for its pending Underground Injection Control rule. In essence, the NODA is a revision to the original Proposed Rule. EPA is considering allowing states to seek a waiver from a general ban against injecting CO<sub>2</sub> above a freshwater aquifer. In some western states, freshwater aquifers can be found at great depths, making the general rule effectively a ban on CCS. If the approach is adopted, a CCS project would still be required to demonstrate that it would not contaminate the deep freshwater reservoir. EPA also indicated interest in allowing CCS projects in basalt deposits and in un-mineable coal seams. At press time, the NODA had not been published in the Federal Register, but EPA provides a copy, and a fact sheet, at: [http://www.epa.gov/safewater/uic/wells\\_sequestration.html](http://www.epa.gov/safewater/uic/wells_sequestration.html).

On August 12, EPA Administrator Jackson ruled on a petition that she review the permit for a Trimble County, KY, coal-fired power plant. One of the permit challenges was that it did not provide a limit for CO<sub>2</sub> emissions. This part of the petition was denied, and Administrator Jackson stated that the so-called "Johnson Memo" of December 18, 2008 (stating that CO<sub>2</sub> is not "subject to regulation" under the CAA) was still in effect. However, in a footnote, she stated that "Actions are underway at EPA that could, when finalized, result in the promulgation of final standards controlling the emission of GHGs. In particular, EPA has announced its intention to propose a rule regulating GHG emissions from light-duty vehicles; that rule would control the emission of GHGs within the meaning of the Johnson Memo." Hence, EPA appears to be saying that the motor vehicle standard must be promulgated before new power plants would be required to conduct a BACT analysis for CO<sub>2</sub> as part of the PSD permitting process. Some have speculated that the rule could be finalized in 2010.

On August 7, EPA announced peer review findings related to the Agency's lifecycle analysis of certain renewable fuels. In a two page Q&A summary of the activity, EPA explained the subject of the peer review, guidelines followed, selection of peer reviewers, and the information to be made publicly available. However, EPA did not provide an overview, summary, or reaction to the peer reviews. Four peer review documents were made publicly available. [Commentary: This issue, in which EPA deeply discounted the climate contribution of corn-based ethanol due to GHG emissions from changes in land

use to grow the corn, has become a very sensitive matter for EPA. The policy was largely responsible for strong opposition of the Chairman of the House Agriculture Committee to H.R. 2454, until significant concessions were provided to agricultural interests in the final bill.] The peer review materials are available at: <http://www.epa.gov/otag/renewablefuels/index.htm>

On August 27, EPA signaled that the New Source Review enforcement initiative is continuing, by filing a complaint in the District Court for the Northern District of Illinois against Midwest Generation, LLC. The utility is charged with violating Prevention of Significant Deterioration rules under the Clean Air Act, and other CAA violations, at six coal-fired power plants in IL. The enforcement action is another volley in a series of actions dating back over a decade and related to making changes at power plants without first obtaining a permit.

### ***Downturn in Electricity Demand may Impact CCS***

*The Wall Street Journal* (August 12) reported on plummeting electricity prices. The PJM electricity pool reported demand down by 4.4% for the first half of 2009, with spot market power prices off 40%. AEP and Southern Co. both reported industrial power use was down over 10% in the past quarter. Not stated in the report, but an obvious consequence of reduced demand is that fewer new power plants will be needed. Given the uncertainty over future regulation of coal, the price of nuclear power, and the price of natural gas, utilities may take the drop in demand as a welcome opportunity to do nothing. That will make the Renewable Electricity Standard tougher to achieve, and limit the host sites for CCS demonstrations.

### ***Agriculture and Climate Issues***

Another *Wall Street Journal* article (August 14) reported efforts by the agriculture industry to seek greater accommodations under future climate change regulation. Recent legislative proposals had assured the industry that it would not be a “covered sector” requiring emission reductions, but rather would be free to market “offsets” - reductions in emissions not covered by the legislation, and sold to other industries whose emissions are covered. According to the article, the industry is concerned that things might change and it might be treated like any other emitter (fertilizer application and livestock provide significant emissions of green house gases (GHGs). The industry concerns may be related to EPA’s reluctance to treat corn-based ethanol as an alternative fuel because of studies showing the initial land clearing associated with increased corn production has GHG emissions that negate the savings from burning ethanol instead of petroleum products.

Algae, which gained attention last month with Exxon’s announcement of interest in production of renewable energy from the simple plants, is getting more favorable attention. Dow Chemical Co. and Algenol Biofuels will build a \$50 million (100,000 gallons per year ethanol) pilot plant at Dow’s Freeport, TX chemical plant. The Algenol process reportedly uses enriched CO<sub>2</sub> feeds to produce ethanol directly from plants, rather than via indirect processes.

<http://www.chron.com/disp/story.mpl/business/energy/6565247.html>

### ***FERC Chairman States that the U.S. has more Natural Gas than Coal***

In August 6 testimony before the Senate Environment and Public Works Committee, FERC Chairman Wellinghoff stated that we now have more than 100 years of natural gas resources, and less than 100 years of coal resources (citing DOE Assistant Secretary Sandalow). He concluded that we should consider natural gas as a bridge to a renewable energy based future. The statements are not in his

written testimony but can be found at 104 minutes into the archived webcast of the hearing at E&PW website. [http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing\\_id=cdecc040-802a-23ad-4421-dd97594eaafb](http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_id=cdecc040-802a-23ad-4421-dd97594eaafb)

On August 10, John Podesta (Clinton's Chief of Staff, and Obama's transition team Co-chair) and former Representative Tim Wirth published a ten page paper for the Center for American Progress recommending expanded use of natural gas as a "bridge fuel" until renewable energy can provide all of our electricity. The increased dependence on natural gas would displace coal-based power production. [http://www.americanprogress.org/issues/2009/08/bridge\\_fuel.html](http://www.americanprogress.org/issues/2009/08/bridge_fuel.html)

New gas plants should be subject to the same rules that force new coal plants to utilize CCS technology, according to executives from leading UK energy companies. UK experts are concerned that the government's new policy on CCS for coal power will lead to a boom in the construction of gas plants which do not have to bury their carbon emissions. Vincent de Rivaz, chief executive of EDF Energy said there was no point forcing only new coal plants to fit the expensive and largely untried technology. Joan MacNaughton, senior vice-president at Alstom, the power generation firm, formerly one of the government's most senior energy advisers, said that CCS should be fitted to new gas plants soon. "We can't do everything at once," she said. "That means fitting CCS technology to new coal plants is the priority as they produce more emissions. But we do have to do new gas plants pretty soon. Building more 'unabated' fossil fuel plants for years to come would just mean we have a much bigger problem to tackle later on." As a result of the UK Policy announced in the spring, only the handful of coal plants which qualify for government financial support to for installation of CCS technology will be built, prompting concern that unabated gas plants could fill the generation gap. Power generation firms expect they will have to fit CCS technology to their gas plants at some point. EDF Energy's gas plant under construction at West Burton has been designed as "carbon capture ready" so equipment can be fitted later. The government has set a target of reducing carbon emissions by 80% by 2050. <http://www.guardian.co.uk/business/2009/aug/16/carbon-capture-gas-power-generation>

### **CCS Projects in the News**

Southern Company announced that it will upgrade the Kemper County IGCC project to capture 65% of its CO<sub>2</sub>, instead of about 50% as initially planned. The change will satisfy one of the eligibility requirements for certain federal investment tax credits. The IGCC is projected to gasify local lignite and sell its captured CO<sub>2</sub> to EOR producers. [http://www.al.com/business/index.ssf/2009/08/southern\\_companys\\_mississippi.html](http://www.al.com/business/index.ssf/2009/08/southern_companys_mississippi.html)

Royal Dutch Shell, UK and electricity and gas network operator National Grid PLC (NGG) are joining Scottish Power's CCS consortium. The consortium is in the process of submitting a bid for the U.K. government's CCS competition, which aims to deliver up to four CCS projects. It is also interested in and involved in the EU competition for a total of around EUR1 billion funding across 12 CCS demonstration projects to be operating by 2015. Shell, a global leader in oil and gas exploration and production and with operations in the North Sea, is already taking part in a variety of projects to capture and geologically store carbon, making the company well placed to be part of the consortium. As hydrocarbon production in the U.K. portion of the North Sea is now declining, government and companies want to use depleted offshore oil and gas fields to store CO<sub>2</sub>, hoping the sector will preserve jobs in the area. The companies are joining Norwegian carbon removal specialists Aker Clean Carbon, in the Scottish Power consortium. Scottish power is itself a subsidiary of Iberdola, the Spanish energy company. German utilities E.ON AG and RWE AG are also competing for government funding for projects at coal-fired power stations. (*Energy Central*, August 13)

The CO<sub>2</sub> Capture Project, is the name of an organization whose members include a number of large energy companies, DOE and the EU, has published a 92 page report, [A Technical Basis For Carbon Dioxide Storage](#). The report, whose lead authors work for oil and gas producing companies, includes detailed discussions on site selection, well construction and integrity, monitoring programs, and development/operation/closure of CO<sub>2</sub> storage facilities. <http://www.co2captureproject.org/>

German CCS projects are floundering because of legislative delays. Trade group IZ Klima, an industry body that represents CCS companies argued that Parliamentary wrangling in June over passing laws to regulate CCS technology have left several major projects on hold. They contend that this is undermining German industry's competitive edge in the fledgling market, which is pushing for legislation that allows carbon sequestration before 2013, when EU wide legislation comes into force that will supersede national law anyway. Even if the next federal government passes the legislation in October, when the new parliament starts, several major projects will have been delayed at least half a year according to Michael Donnermeyer, a communication manager with IZ Klima. The next parliament will be elected on 27 September, and IZ Klima is calling for the CCS legislation to be voted as soon as possible. Several major projects are currently waiting for the legislative go-ahead. These include: The Vattenfall at power station near Janschwalde, an Eon power plant near Wilhelmshaven, an ArcelorMittal project at a steel mill near Eisenhuttenstadt, the Dong Energy power station at Greifswald and an RWE at power station near Huerth. But not all of the projects will wait until the parliament passes legislation. Some are seeking alternative ways to go forward with their plans. One of the most advanced projects, Vattenfall's CCS pilot plant at Schwarze Pumpe coal station near the German city Spremberg is set to bury emissions temporarily at a location different from the one next to the facility. A spokesman with Vattenfall, Damian Mueller, said the company plans to bury CO<sub>2</sub> at a site under research which is entitled to hold a permit for sequestration regardless of the CCS law. The research project, which has been in operation near Ketzin since last July, is around 150 kilometers away from Vattenfall's pilot plant which will require trucks to transport 10.000 tons of CO<sub>2</sub> during three months from October, he said. Mueller added the Schwarze Pumpe project has been operational since last September, and it emitted around 1,000 tons of CO<sub>2</sub> in the air in the absence of the permit. (*Point Carbon*, August 7)

## China & CCS

China recently released a voluminous study: "2050 China Energy and CO<sub>2</sub> Emissions Report." The study proposes setting relative and then absolute targets for limiting China's emissions of greenhouse gases from human activities. "Relative" targets could involve carbon intensity goals, curbing the amount of emissions needed to create each unit of economic worth. The report acknowledges that the government might need to apply absolute caps on emissions. China might also create a "cap-and-trade" market so companies could buy and sell emissions rights, domestically and internationally. The report devotes a chapter to the potential benefits and costs of a 'carbon tax'. Such a tax, applied to fossil fuels such as coal, gas and oil, "would play a clear role in curtailing our country's future carbon dioxide emissions." In the study, Jiang Kejun of the Energy Research Institute says that if China continues a 'business as usual' approach focused on economic growth and does little to curb emissions, its carbon dioxide output from fossil fuel alone could peak at the equivalent of 3.5 billion tons of pure carbon a year by 2040. That does not include greenhouse gas emissions from other sources, such as livestock and land-use changes. If China adopts policies to promote 'low-carbon development', emissions could reach 2.4 billion tons of carbon a year by 2050. Under an 'enhanced low carbon scenario' of even more stringent steps, they could reach a maximum of 2.2 billion tons a year in 2030 and fall to 1.4 billion tons in 2050. An enhanced low-carbon growth strategy would be difficult but doable,' Jiang told Reuters. For a graphic on China's emissions scenarios go to

<http://graphics.thomsonreuters.com/RNGS/AUG/CHINA.jpg>  
<http://www.forbes.com/feeds/afx/2009/08/17/afx6784134.html>

## **EU Countries & CCS**

Scientists have found that the rock formations beneath the North Sea bed have enough room to store up to 300 years worth of emissions from northern Europe's power stations. It means Britain could potentially earn up to £4 billion a year by allowing countries such as Germany, France and Denmark captured from their power stations to pump CO<sub>2</sub> into rocks beneath UK waters. "We believe the carbon storage business could be huge for Britain with a value of £2 billion to £4 billion a year by 2030," said Mike Stephenson, head of science for energy at the British Geological Survey (BGS). "We estimate it could sustain 30,000-60,000 jobs." Two new studies have shown that Britain is better placed to exploit the technology than any other European country. One of the studies, by geologists at Edinburgh University, has shown that the parts of the North Sea controlled by Britain overlies vast tracts of sandstone rock strata that are ideal for holding CO<sub>2</sub> (<http://www.scotland.gov.uk/Resource/Doc/270737/0080597.pdf>).

The second study was carried out by Stephenson's colleagues at the BGS who since 1996 have been probing the fate of 10m tons of CO<sub>2</sub> pumped under the sea bed by Statoil, the Norwegian energy company. It showed the CO<sub>2</sub> is stable and so unlikely to bubble back out as some had feared ([http://www.bgs.ac.uk/research/energy\\_co2.html](http://www.bgs.ac.uk/research/energy_co2.html)).  
<http://www.timesonline.co.uk/tol/news/environment/article6797704.ece>

UK Secretary of State for Energy and Climate Change Ed Miliband said that he saw coal playing a role in the energy mix in the future, with the assistance of CCS, because the coal of the future must be clean. Addressing delegates gathered at the South African center for CCS, in Johannesburg, Miliband said that public acceptability of CCS would need to be gained through rigorous and convincing scientific work. He stated that there is still a lot of scientific, test and demonstration work that needed to be done in order to convince the public of the safety of CCS technology, as well as its economic feasibility. The British High Commission in South Africa is one of the core members, providing funding for the South African center for CCS, and Miliband congratulated the center on the work it was doing. The center, led by Dr. Tony SurrIDGE, was focused on drawing up a comprehensive CCS storage atlas for South Africa, which would show in detail potential storage sites for sequestered CO<sub>2</sub>. Following the completion of the storage atlas in 2010, the center would aim at commissioning a test injection site by 2016, and hoped to have a demonstration plant up and running by 2020, which would inject some 100 000t of carbon into a storage site. The target of 2025 was set for commercial operation of a fully integrated CCS plant. <http://www.miningweekly.com/article/making-coal-a-clean-fuel-of-the-future-2009-08-14>

German companies recently commissioned a pilot system to capture CO<sub>2</sub> from flue gases at a coal fired power station operated by utility RWE in western Germany. The launch of the pilot plant to test the process at RWE's Niederaussem brown coal plant signifies another step towards coal generators' aims to capture climate-harming CO<sub>2</sub> emissions, and in another step burying them safely underground. The EU wants all new coal-to-power plants after 2020 to be equipped with CCS technologies. The pilot unit was 40% funded by the Berlin ministry, said RWE and its partner's chemicals group BASF and Linde. RWE Chief Executive Juergen Grossmann said that a national CCS law, which had been postponed in June, needed to become a top priority after national elections in September. He said that apart from power generators, the CCS technology was also needed by refineries, chemical plants, steel mills and cement factories. RWE is seeking one billion euros from a partner or public funds to help finance a coal plant

using CCS of commercial size at Huerth, which could be up and running from 2014.

<http://uk.reuters.com/article/idUKLI22986820090818?sp=true>

### **Australia & CCS**

Australia's Gorgon liquefied natural gas project cleared another hurdle recently when the national and Western Australian state government agreed to accept joint liability for storing CO<sub>2</sub>. Prime Minister Kevin Rudd said the two governments would accept any liabilities arising from the carbon storage in geological formations under Barrow Island, off the Western Australian coast. Chevron holds a 50% stake and is the operator of the project, while Royal Dutch Shell and Exxon Mobil Corp each hold 25%. On August 10, the Western Australia state government granted environmental approval for the project, leaving the national government to finalize its own environmental approval process.

<http://money.ninemsn.com.au/article.aspx?id=850986>

Australia's Cap and Trade legislation, passed earlier by Australia's House of Representatives, was rejected 42-30 by their Senate. This sets in motion some interesting politics in Australia. If the bill is voted down a second time, that action triggers a "double dissolution," which means both houses of the Parliament are dissolved and there is a general election. Some have speculated that Prime Minister Rudd would prefer to have that outcome, both to put the climate issue before the general electorate, and to accelerate the election cycle from later in 2010, when unemployment is expected to have deteriorated further, but Rudd stated on August 14 that he would not call for a "snap election." An additional complication is that, like H.R. 2454, the Australian bill combines a renewable electricity standard (RES) with a GHG Cap and Trade program. In addition to deciding whether to seek passage of the entire package, the administration must also decide whether to seek adoption of only the RES portion. A similar choice might emerge in the U.S.

[http://www.forbes.com/feeds/reuters/2009/08/13/2009-08-14T005347Z\\_01\\_SYD432011\\_RTRIDST\\_0\\_AUSTRALIA-POLITICS-UPDATE-2.html](http://www.forbes.com/feeds/reuters/2009/08/13/2009-08-14T005347Z_01_SYD432011_RTRIDST_0_AUSTRALIA-POLITICS-UPDATE-2.html)

In an update on the above story, a 20% RES standard (to be achieved by 2020) was passed by the Australian House on August 20 and by their Senate on August 25.

<http://www.renewableenergyworld.com/rea/news/article/2009/08/australian-senate-passes-renewable-energy-target-bill?cmpid=rss>

### **Copenhagen meeting to extend the Kyoto agreement beyond 2012**

The big international story for climate change in 2009 is the Copenhagen meeting this December. At that meeting, nations will decide what to do about GHG emissions in the post-2012 period. The U.S. appears to be setting a low bar for developing nations, requiring "binding actions" not "binding targets," according to the U.S. lead negotiator, Jonathan Pershing.

<http://www.eenews.net/Greenwire/2009/08/14/2/>

World leaders at the Copenhagen meeting in December will have sharply different views on the amount by which carbon emissions should be reduced. They are also insisting that both Europe and the U.S. commit to 40% cuts in emissions by 2020 against 1990 levels. The countries of the EU have already committed themselves to a 20% cut on 1990 emissions levels by 2020, followed by an 80% cut by 2050. New Zealand announced that it would cut emissions by 10 to 20% below 1990 levels by 2020. China and India have refused to offer any specific targets for cuts to their emissions. The Pacific Islands Forum, representing the group of low-lying island nations threatened by rising sea levels, last week urged cuts of 45%. Recently, Yu Qingtai, China's top climate envoy, reiterated his country's view that developed nations had a moral obligation to make the more drastic cuts because they had prospered from decades

of emissions. He said China's only "quantified and measurable target" would be an aim to reduce energy consumption per unit of its gross domestic product by 20% on 2005 levels by 2010.

<http://www.telegraph.co.uk/earth/environment/climatechange/6004553/Ban-Ki-moon-warns-of-catastrophe-without-world-deal-on-climate-change.html>

Cutting greenhouse gas emissions to slow global warming and adapting to impacts such as droughts and rising sea levels are likely to cost about \$300 billion a year, the top U.N. climate change official said. Yvo de Boer also was quoted by *Reuters* as saying that cuts promised so far by 2020 by rich nations were "miles away" from long-term goals set by a Group of Eight summit last month. "Over time, according to my own analysis, we are going to need \$200 billion a year for mitigation and probably in the order of \$100 billion a year for adaptation ... from 2020 onwards," he said. He also said he hoped the talks would raise developed nations' targets for cuts in greenhouse gases towards a "beacon" of 25 to 40% below 1990 levels by 2020 outlined by the U.N. Climate Panel to avoid the worst of global warming. G8 leaders agreed at a summit in Italy last month to cut developed nations' emissions by 80% by 2050 and to limit global warming to a 2 Celsius rise (3.6 Fahrenheit). But average 2020 goals fall well short of a 25 to 40% cut. <http://www.reuters.com/article/latestCrisis/idUSLB20550?sp=true>



*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.*