July 30, 2010

Sequestration News

Senate energy legislation is in a state of substantial flux, with Majority Leader Reid indicating that he will not advance either a climate title or a renewable electricity standard (RES). Advocates of various energy and climate options are pressing for consideration of their approaches, especially for the inclusion of an RES. There does not appear to have been any significant discussion of a Senator Lugar type of "Diverse Energy Standard" (that would include nuclear and CCS). Senator Bingaman did not include CCS and nuclear in his RES. For a Diverse Energy Standard (DES) to work effectively at fostering a portfolio of technologies, the Senator Lugar bill (S. 3464) may have to be modified to mandate minimal levels of each major generation category (renewables, nuclear, CCS).

Senators Jay Rockefeller (D-WV) and Voinovich introduced S. 3589, a bill providing financial incentives and a regulatory framework to facilitate development and early deployment of CCS technology. Senator Rockefeller is also continuing to seek action on his bill to delay EPA regulatory action on climate for 2 years.

Duke Energy's CEO Jim Rogers wrote Senator Reid on July 21 to urge inclusion of a carbon title in the Senate's energy bill, noting that without legislation, the U.S. would over-rely on natural gas power plants for new electricity supply, an outcome which would further erode our gas-sensitive industrial manufacturing base.

The Clean Air Task Force report submitted to the Administration's CCS task force strongly supported the need for CCS on gas as well as coal systems. Citing the growth of coal use by China, the report concluded that "there is little hope for success" in addressing the climate challenge without finding a way to burn coal cleanly. It also recommended carbon legislation and regulation.

CCS Related Congressional Appropriation Actions

The Senate Appropriations Committee approved a FY2011 spending bill on July 22 that included $726 million for DOE/FE – well above the Administration's request and the House-passed bill, and $7 billion in new loan guarantee authority for coal and pet-coke systems that include CCS.

Climate Legislation

Senator Reid, Senator Kerry and White House climate czar Carol Browner called a press conference on July 22 to announce that Senate Democrats were abandoning efforts to pass a cap and trade (C&T) bill before the August recess. A more limited energy bill addressing the Gulf oil blowout, subsidizing natural gas vehicles, electric vehicles, and energy efficiency will be pursued (http://www1.voanews.com/english/news/usa/Senate-Democrats-Give-Up-on-Climate-Legislation-Before-Recess-99133554.html). Other press reports suggested that Senator Reid has also dropped efforts to seek a renewable electricity standard (RES). *Bloomberg* reported that Senator Kerry suggested that climate legislation might reemerge in a lame-duck session after the November elections (http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2010/07/23/bloomberg1376-L5ZC4T0YHQ0X01-4FU6C26UI55B7EIBSBUJIS7EPJ.DTL), but others expressed skepticism. For example, *Climatewire* (July 21) quoted Sen. George Voinovich (R-OH) as stating that the legislation would not be enacted by year's end and that "Cap and trade is dead, OK?".

Environmental groups have reacted negatively to Senator Reid's decision to drop climate provisions from the Senate's energy bill. NRDC appealed to "climate obstructionists" to "stop blocking our future." http://www.nrdc.org/media/2010/100722.asp Greenpeace urged its members to use Facebook, Twitter, etc., to post articles they might find that recommend continued use of fossil fuels and append comments promoting renewable energy instead. http://members.greenpeace.org/blog/greenpeaceusa_blog/2010/07/26/help-call-out-the-dirty-lie

Duke Energy's CEO Jim Rogers wrote Senator Reid on July 21 to urge inclusion of a carbon title in the Senate's energy bill, noting that without legislation, the U.S. would over-rely on natural gas power plants for new electricity supply, an outcome which would further erode our gas-sensitive industrial manufacturing base.

Greenwire (July 26) reported that former Senate Majority Leader Tom Daschle (D-SD) and Bob Dole (R-KA), and Iowa Governor Chet Culver, are urging Senator Reid to reinsert Committee Chairman Jeff Bingaman (D-NM)'s RES provision into the Senate energy bill. .

On July 14, Senators Jay Rockefeller (D-WV) and Voinovich introduced S. 3589, a bill providing financial incentives and a regulatory framework to facilitate development and early deployment of CCS technology. Summary information and a press release are available on Sen. Rockefeller's website: http://rockefeller.senate.gov/press/record.cfm?id=326356&

EIA has published its analysis of the draft Kerry-Lieberman climate bill. A rich body of modeling results is available, along with a report, at EIA's website. In addition, readers will see some sensitivity analysis that examines the prospects of increased shale-gas. The major overall findings of the analysis are that most compliance through 2035 will come via international offsets, and that the cost of compliance hinges primarily on the availability and cost of international offsets (largely paying for projects to avoid deforestation and for reforestation in developing nations, in lieu of reducing domestic GHG emissions). EIA's projected allowance prices appear to be about 40% higher than EPA's. http://www.eia.gov/oiaf/servicerpt/kgl/index.html

On June 24, the CRS provided Congress with a 17 page *Comparison of Selected Senate Energy and Climate Change Proposals*. One of the categories of comparison was financial incentives for CCS technology.

EPA and CCS

With the apparent demise of comprehensive climate legislation from the 111th Congress, fresh attention has been focused on EPA rules to address global climate change under current authority, and efforts by Congress to block those rules. Recall that a resolution to block such rules by Senator Lisa Murkowski failed by a vote of 47/53 in June. S. 3072, a bill introduced by Senator Rockefeller in March to delay such rules for 2 years, will likely receive additional consideration. A similar bill (H.R. 4753) was introduced by Representative Nick Rahall in the House.

On July 29, EPA responded to 10 challenges to the Agency's December 2009 "Endangerment Finding". The Agency denied all 10 petitions, saying it "found no evidence to support these claims" of a weak (or erroneous) scientific base for climate change impacts. All of the petitions, an EPA "decision document", a more detailed 3-volume report discussing the petitions, and related materials can be found at EPA's website: http://epa.gov/climatechange/endangerment/petitions.html

On July 7, the American Materials Manufacturing Alliance (a coalition of energy-intensive manufacturing associations) wrote Senators Kerry and Lieberman and challenged EPA's findings that job impacts of H.R. 2454 and the draft Kerry-Lieberman climate bill would be modest. The Alliance stated that its member companies have lost 2.1 million jobs since December 2007, and that they were very vulnerable to foreign competition. The industries believe that EPA failed to adequately model the cost of shifting coal-based industrial operation to natural gas, in response to the proposed legislation. The Alliance also challenged EPA's assumption that the industries could reduce their energy intensity 20-45% by 2020.

Administration's CCS Task Force

The Clean Air Task Force (CATF) was one of many groups that met with the Administration's CCS Task Force. A press release regarding their basic message is at: http://www.catf.us/newsroom/releases/2010/20100706-CATF_Presents_Recommendations_to_Presidential_Task_Force_on_CCS.pdf . CATF provided the Task Force with a 69 page report summarizing their views on CCS. The report is strongly supportive of enhanced funding of CCS projects, noting that "federal spending on CCS is only around $8 billion, a fraction of what is needed to build enough CCS projects to eliminate technical uncertainties." Citing the growth of coal use by China, the report concludes that "there is little hope for success" in addressing the climate challenge without finding a way to burn coal cleanly. After performing detailed modeling of the utility sector, the CATF concluded that performance standards are needed for CO_2 emissions, "particularly for natural gas plants, that in effect require the installation and operation of CCS." In the absence of new legislation, the report also recommended using existing CAA authority to establish "performance standards for new and existing units." The report is available at: http://www.catf.us/resources/publications/view/134 .

U.S. Climate Task Force

While the U.S. continues to consider climate proposals, the U.S. Climate Task Force released a new analysis of how Europe's cap-and-trade program has worked in practice. The report, *Europe's Emissions Trading System*, (http://www.climatetaskforce.org/2010/06/22/europes-emissions-trading-system) by Harvard economist and international trade expert Richard Cooper, details how this approach has produced substantial volatility in the price of carbon, proven to be vulnerable to significant abuses, and has failed to spur any meaningful reductions in greenhouse gas emissions.

http://www.prnewswire.com/news-releases/europes-ets-failures-forecast-problems-for-us-cap-and-trade-96947739.html

Clean Development Mechanism Fraud

Climatewire (July 26) reported that the Executive Board of the Clean Development Mechanism (CDM), a Kyoto Protocol process by which wealthy nations can generate climate reduction credits by paying for GHG reducing projects in poorer nations, are reviewing claims of fraud.

Climate Data Questions

The London *Guardian* reported that a review had found no evidence that climate data had been "fudged" by scientist at the University of East Anglia's Climatic Research Unit. The review panel did, however, fault the scientists "for not being open enough about their work, and said they were 'unhelpful and defensive' … responding to FOI law" requests. The review panel found certain graphics produced by the CRU to be "misleading," but decided that this was not deliberate and had been adequately caveated in the report text.
http://www.guardian.co.uk/environment/2010/jul/07/climategate-review-clears-scientists-dishonesty

Australia and CCS

Australia's Labor (liberal) Party has replaced Prime Minister Rudd with his former deputy, Julia Gillard. Rudd had, until climate legislation was twice rejected by the Senate, favored an aggressive climate change mitigation policy for Australia, and reportedly helped broker the Copenhagen agreement. It is unclear where Gillard stands on carbon regulation, but she has suspended a government sponsored ad campaign supporting a new tax on mineral and energy sales to China. http://ap.news-journalonline.com/dynamic/stories/A/AS_AUSTRALIA_POLITICS?SITE=FLDAY&SECTION=HOME&TEMPLATE=DEFAULT

Australia votes on a new government on August 21. The various contending parties are offering widely differing views on what the national climate policy would be. Australia's main opposition Liberal-National coalition said it would scrap a A$100 million/year Global Carbon Capture & Storage Institute (GCCSI) if elected to office next month, amongst other budget cuts. In justifying its decision to dump the Canberra-based not-for-profit institute, if elected, the Liberal-National coalition noted that no other countries provide funding--despite it having the support of more than 30 world governments, 130 corporations and other non-government groups. http://www.nasdaq.com/aspx/stock-market-news-story.aspx?storyid=201007200053dowjonesdjonline000008&title=update-australia-opposition-would-scrap-global-carbon-institute

UK and CCS

A UK climate advocacy group called the Climate Change Committee is in the process of publishing its 2nd Annual Report to the British Parliament on reducing GHG emissions. Among other things, the group is advocating the application of CCS to natural gas combined cycle power plants.
http://www.theccc.org.uk/reports

The UK Committee on Climate Change (CCC) has indicated that in order to be on course to meet the 2050 target, the UK's power sector will need to be largely de-carbonized by 2030. The UK CCC believes that it is important to assess the opportunity to apply CCS on natural gas fired power generation and industry. In June, the CCC published a report led by Element Energy Ltd, working with partners Carbon Counts and Amec, focusing on the opportunity for CCS on natural gas fired power generation and industry. The report quantifies:

- The technical potential for CCS in industry and the gas power sector.
- Plausible economic potentials (i.e. market sizes and breakdown) for CCS in industry and the gas power sector under a range of technology readiness, build rate and CO_2 price scenarios.
- The impacts on CCGT-CCS economics in the context of high renewable penetration leading to low load factors for fossil plants.

To obtain a copy of the report, please email Kate.Harland@element-energy.co.uk or Harsh.Pershad@element-energy.co.uk.

The CCC has also warned that unless "urgent action" is taken the UK will miss its emissions target after the recession created the illusion of a significant decrease in carbon production. (Energy Central, July 8)

The impact of the UK government's climate change policies imposes significant costs on its energy intensive industries. If the trend continues, some companies could leave the UK for good according to a recent report. The Cumulative Impact of Climate Change Policies on UK Energy Intensive Industries is published by the Energy-Intensive Users Group (EIUG) and the Trade Union Council (TUC) and says that the forecast increase in total energy bills, taking electricity, gas and emissions reduction schemes together, could be as high as 141% by 2020. The report says that these cost increases present a major challenge to the viability of a number of named companies across different energy-intensive manufacturers in the UK - including ceramics, chemicals, steel, aluminum and paper. The full report is available at: http://www.tuc.org.uk/extras/wwastudy.pdf.

London-based policy analyst Civitas said that thousands of UK manufacturing jobs are threatened by the government's drive to slash carbon dioxide emissions and boost renewable power. Green energy policies have already boosted energy bills to businesses by 21%, a figure that could rise to 70% by 2020, the group said. That endangers jobs in industries such as steel, cement, chemicals, paper, ceramics and plastics, according to Jeremy Nicholson, a co-author of the 35 page study. It said that within 10 years, 46,000 jobs in the UK chemical industry are under threat. A further 87,000 jobs dependent on the industry would also be in danger, it said. The report, British Energy Policy and the Threat to Manufacturing Industry, by Ruth Lea and Jeremy Nicholson, is available from Civitas at: http://www.civitas.org.uk/press/recent.php and http://www.businessweek.com/news/2010-07-12/u-k-energy-policy-threatens-thousands-of-jobs-civitas-says.html.

China and CCS

China, the world's biggest emitter, may see its carbon-dioxide emissions peak around 2030 as the country taps cleaner sources of energy. Jiang Kejun, director of energy and market analysis at the National Development and Reform Commission's (NDRC) Energy Research Institute, said that emissions may reach almost 9 billion metric tons in 2030, from about 7 billion tons currently. China has pledged to reduce its carbon-dioxide output per unit of gross domestic product by 40 to 45% from 2005 levels by 2020. "The emissions target is not something easy to achieve, but we believe China has the ability to do

it," Jiang said. China will have to raise the efficiency of burning coal and increase the share of cleaner sources including nuclear power in its energy mix, said Jiang, whose team helped the government draft the 2020 emissions-reduction target. Citing data from his institute, Jiang said that the nation's energy consumption may rise to as much as 4.3 billion tons of coal equivalent by 2020. That is equal to about 8.4 billion tons of carbon-dioxide emissions, he said. Energy use was 3.07 billion tons last year, according the National Bureau of Statistics. To reduce China's reliance on polluting fossil fuels, the government has been subsidizing renewable energy including wind and solar power. China spent $34.6 billion on clean-fuel projects last year, almost double the $18.6 billion invested by the U.S., according to estimates from Bloomberg New Energy Finance. China may spend about 5 trillion Yuan ($738 billion) in the next decade developing cleaner sources of energy, Jiang Bing, head of the National Energy Administration's planning and development department, said on July 20.
http://www.bloomberg.com/news/2010-07-23/china-s-carbon-emissions-may-reach-peak-by-2030-state-researcher-says.html

China's vice minister for environmental protection, Zhang Lijun was quoted as saying that China was "not very optimistic" that its efforts to slash emissions were working. Beijing issued a similar warning a month ago, prompting speculation that it could miss its emissions reduction targets. He said a severe drought in southwestern China, increases in the output of high-emissions industries and the "slack mentality" of local governments and firms were complicating China's efforts to slash emissions. Beijing has pledged to reduce its carbon intensity -- the measure of greenhouse-gas emissions per unit of gross domestic product -- by 40 to 45 percent by 2020 based on 2005 levels. Last month, Premier Wen Jiabao laid out a series of measures to help tackle the situation, including punishing local authorities that did not achieve their targets. The government has already said it will spend 83 billion Yuan (12 billion dollars) on promoting emissions cuts in 2010.
http://www.google.com/hostednews/afp/article/ALeqM5hQE93u_7n5izAUp6BFL-H_N-gIPg

China's CO_2 emissions from fossil fuel rose by 9 percent in 2009. China's greenhouse gases from fuels like oil and coal grew to 7.5 billion tons, even though global emissions fell for the first time since 1998. China, the first nation to emit over 7 billion tons of CO_2 in a year, increased its lead over the U.S., the second-largest emitter which it surpassed in 2008. U.S. fossil fuel emissions fell by 6.5 percent to 5.9 billion tons, the lowest level since 1995 according to the recently released BP Statistical Review of World Energy. Emissions from emerging countries, which now account for half the global total, grew by over five percent last year. Emerging countries also increased their lead over OECD nations, which saw their emissions fall by six percent. India's fossil fuel emissions grew by seven percent to overtake Russia, making it the third largest emitter.
http://af.reuters.com/article/energyOilNews/idAFLDE65813J20100609?sp=true

China is threatening harsh policies to curb energy use. Leaders are unveiling campaign-style measures to reduce energy consumption and carbon emissions, including by simply shutting down companies that fall short. China's top climate change official, Xie Zhenhua, said shutdowns would focus on areas of west and southwest China, where energy intensity had increased. This week's flurry of policies and official commentaries follows a meeting of top ministers and executives at a meeting in early June. Energy reduction measures will hit demand for resources at the same time that China's construction and heavy industry sectors are already bracing for a sharp slowdown from government efforts to stop real estate speculation. Official figures show real estate sales in 70 cities fell 25 percent in May. China's National Energy Bureau said electricity consumption dropped 2 percent between April and May, but remained 20.8 percent higher than a year earlier. More energy-reduction measures are expected. A Chinese investment banker, who advises most of China's top resources companies, said the government was motivated by concerns about energy security, carbon emissions commitments and also the economy's

long-term competitiveness. http://www.smh.com.au/business/china-to-cut-energy-use-carbon-emissions-20100617-yjxy.html

The Chinese government is drafting energy legislation that calls for greater reliance on renewable energy and greater emphasis on energy conservation in the future. But the plan preserves a central role for coal. And the discussions in China have been focused almost entirely on security issues. China anticipates more years of global leadership in economic growth while global warming remains a secondary concern. Secure sources of energy to fuel that growth are what matter most, whatever the implications for world energy markets and the global environment. The proposed law, which is expected to be adopted by early next year, says that "energy supply should be where you can plant your foot on it," meaning that as much as possible should come from within China, said Li Junfeng, a senior energy policy maker and member of the interagency committee drafting the law. That belief has underpinned China's rapid expansion in renewable energy, because it tends to be made in China, Mr. Li said. China has just emerged as the world's largest manufacturer of wind turbines and solar panels, and plans to be the world's biggest builder of nuclear power plants in the coming decade. It invested nearly twice as much as the U.S. last year in renewable energy.

Energy security also explains the continued reliance on coal, for which China has the world's third-largest reserves, after the U.S. and Russia. China's top global warming negotiator, Xie Zhenhua, is not even on the 21-member commission that China created in January to set energy policy. An oil exporter as recently as the early 1990s, China passed the U.S. last year as the biggest customer for Saudi oil and gas exports. Within as few as five years, it will be importing a higher percentage of its oil than the U.S. Chinese government officials worry about the security of energy supplies from abroad. And it is why China's military and its main security and intelligence agency are playing an increasingly visible role in energy policy making.

The bulk of China's imported oil comes through the Strait of Malacca, between Singapore and Malaysia on one side and Indonesia on the other. While oil demand has risen inexorably in China, domestic production has barely increased. Chinese companies have struggled to acquire oil fields elsewhere. Shut out of the most attractive operations, which are already controlled by exporting countries or Western multinationals, Chinese companies have ventured into some of the world's most volatile countries, notably Sudan and now to some extent Iraq and Iran. Somali pirates have begun preying on tankers and freighters bound for China from the Mideast. It helps explain why China has been looking for ways to import more of its oil through pipelines instead of by sea. Mr. Li said recently that while China might be further along than the U.S. in drafting energy legislation, and might have a large and growing sector for the manufacture of renewable energy, it still needed American technology to improve its equipment. "We need international cooperation," he said. "America should be the leader." http://www.nytimes.com/2010/06/18/business/global/18yuan.html

A $10 million enhanced coal bed methane project involving CSIRO, JCOAL and the government of China was announced. The project will be located in Shanxi Province and focus on advancing enhanced coal bed methane (ECBM) recovery and providing a pathway to adoption for near zero emissions technology from coal-fired power. Director of CSIRO's Advanced Coal Technology research, Dr John Carras, says the ECBM project will test new approaches to maximize CO_2 injection and methane recovery. CSIRO's research is supported by the Japan Coal Energy Centre, JCOAL. The ECBM demonstration project received funding from the Chinese and Australian Governments as part of the Asia-Pacific Partnership on Clean Development and Climate. It builds upon CSIRO's existing collaborations with China, which include supporting the launch of a post combustion capture (PCC) pilot plant in Beijing and the first capture of CO_2 in China using PCC technology. Work has also begun on a second, transportable PCC pilot plant that is designed to capture 600 tons per year of CO_2. The data collected from this demonstration

will contribute to the techno-economic assessment of PCC and direct the next steps in commercial-scale technology development. http://www.environmental-expert.com/resultEachPressRelease.aspx?codi=180048&lr=1&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:+environmental-expert/news-air+(Latest+News+%26+Press+Releases

The Netherlands and CCS

At the request of the Lower House of the Dutch Parliament, a study was conducted regarding accelerating large-scale CCS project in the North of the Netherlands. As of 2015, CCS could be possible in the North of the Netherlands and the gas fields, Boerakker (Groningen), Eleveld (Drenthe) and Sebaldeburen (Groningen, would be the first candidate repositories for captured carbon dioxide). Final decisions will be taken by the next government. A letter written by Minister Van der Hoeven of Economic Affairs and Minister Huizinga of Housing, Spatial Planning and the Environment (VROM) to the Lower House recommended a CO_2 transport and storage strategy offered by natural gas exploration, production, transportation and sales company EBN and gas infrastructure company Gasunie at the request of the Ministry of Economic Affairs. Although the government currently is considering these three gas fields, no decision has yet been made regarding whether CO_2 will in fact be stored there. The environmental impact report is expected to be completed in 2011, with investigations starting in autumn 2010. The next government will be responsible for making a decision regarding the final storage location and transport route in 2011. http://energyportal.eu/latest-emissions-news/8888-dutch-government-announces-preferred-co2-storage-locations-in-the-north-of-the-netherlands.html

South Korea and CCS

The South Korean government issued a statement on July 12 that the country's total public and private investment in CCS would reach an estimated 2.3 trillion won ($1.92 billion) to 2019. Public sector investment would account for 1.2 trillion won, approximately 50% of the total. Korea Electric Power Corp (KEPCO) is currently the largest corporate funder. The state-run utility said last September it would spend 2.8 trillion won to develop environment-friendly technology including CCS by 2020. South Korea is the OECD's fastest-growing carbon polluter and the world's No. 5 oil importer. ($1=1197.5 Won). http://af.reuters.com/article/energyOilNews/idAFTOE66B06520100712

Reuters reports that scientists have made significant progress in development of metal-organic frameworks (MOFs) for absorption of CO_2 in flue gases. Work at UCLA's NanoSystems Institute and at Korea's Soongsil University were specifically cited (as described in a *Science* journal article). http://www.reuters.com/article/idUSTRE66E1X320100715

Germany and CCS

The German magazine Spiegel ran a lengthy article July 22 on the future of global coal use, with the general themes that continued use of coal is unavoidable, and that CCS is an essential technology to meet global climate goals. The tone of the article is captured in its title: "Black Future, The World's Ever-Increasing Hunger for Coal." The article quoted the UK's Lord Stern (of the infamous "Stern Report") who concurred with these general findings and noted that a shift to renewable energy will not occur soon: "It will be a long bridge."
http://www.spiegel.de/international/world/0,1518,707654,00.html

The underground storage of carbon dioxide emissions could be a reality in Germany beginning in 2017, after the German government recently accepted a draft law to regulate the CCS technology. Under the legislation presented by the environment and economy ministries in Berlin, test sites will first be established, before the government decides in 2017 whether CCS should be used as a long-term environmental solution. The German Energy and Water Association hailed the deal, with its chairman Hildegard Mueller saying: "Now concrete CCS projects can soon be implemented." The draft law will now be considered by Germany's cabinet and must win parliamentary approval. http://www.google.com/hostednews/afp/article/ALeqM5glZ47FO4kH5-OEl1o5FkoxCJDlcw

Canada and CCS

Canadian Environment Minister Prentice announced June 23 that Canada will propose regulations in 2011 to phase out older coal-fired power plants "that have reached the end of their economic life" and require the remainder (and any new coal units) to be as clean as (uncontrolled) natural gas. Natural gas power plants have about one-half the emission rate of coal-based units, so compliance would require installation of CCS technology. Canada has 51 coal units and obtains 19% of its electricity from coal. http://www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=E5B59675-BE60-4759-8FC3-D3513EAA841C and http://www.reuters.com/article/idUSN2320360820100623 , ClimateWire (June 24).

The Canadian Standards Association and the International Performance Assessment Centre for the geologic storage of Carbon Dioxide (IPAC-CO2) announced an 18 month plan to develop guidelines that will cover the lifecycle of a CO_2 storage project. The Canadian Standards Association is a non-profit group that sets out standards on everything from safety to the environment. The standards to be developed, which officials hope will be adopted by Canada and others, will address everything from selection of the right geological formation in which to inject the gas to the monitoring of the location once it's sealed. Guidelines to deal with transportation and capture of emissions would come later. So would storage standards for things including enhanced oil-recovery projects or saline aquifers. For now, experts will be called in from industry, non-governmental organizations, the environmental fields and elsewhere to focus on the priority of getting harmful CO_2 emissions into the ground. http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/carbon-capture-guidelines-in-works/article1605528/?cmpid=rss1

South Africa and CCS

South Africa will release its first atlas showing potential storage sites for carbon dioxide. Tony Surridge, head of South Africa's CCS Centre, told *Business Day* that a geological storage atlas would be launched on August 24. The South African National Energy Research Institute, which is the parent body of the center, estimated in its annual report that 40 million tons of carbon dioxide a year could be stored geologically in South Africa over the next 100 years. (*Energy Central*, July 21)

Scotland and CCS

Rock beds beneath the Moray Firth in Scotland are to be examined as a potential site for carbon storage. Experts believe the Captain Sandstone field, which lies half a mile below the sea bed and at least 30 miles into the North Sea has the potential to store decades of CO_2 output from coal-fired power stations like Longannet in Fife. Dr Maxine Ackhurst, from the British Geological Survey, said, "Scotland has a huge potential for carbon dioxide storage in offshore sandstones beneath the North Sea...the Captain

Sandstone field, is twice the area of Fife." Researchers from the Scottish Centre for Carbon Storage (SCCS) will examine the challenges of injecting the captured carbon dioxide. Computer modeling of CO_2 injection into the rocks will test the long-term performance of the rocks to ensure CO_2 remains permanently locked in. The study is being funded by industry and the Scottish government. http://news.bbc.co.uk/2/hi/scotland/highlands_and_islands/10214297.stm

Climate and CCS Related Reports

- The Aspen Environmental Group prepared a report for the American Public Power Association identifying infrastructure requirements and costs for replacing the existing coal fleet with natural gas. The principal cost would be for new pipelines to connect shale gas resources to electricity demand centers – amounting to about $350 billion in capital costs. [This is roughly the capital cost of the replacement natural gas power plants themselves.] https://appanet.cms-plus.com/files/PDFs/NaturalGasStudyRelease7710.pdf
- On July 12, NETL published Overview of U.S. Coal Supply and Infrastructure, DOE/NETL-403/081709. The 51 page report provides a summary of U.S. coal production, transportation, and use.
- WRI has published Reducing GHG Emissions in the US Using Existing Federal Authorities and State Action. The report describes how GHG reductions could be achieved without new climate legislation. Potential reductions "approach but fall short of … 17% below 2005 levels by 2020." http://www.wri.org/
- The IEA and Carbon Sequestration Leadership Forum published Carbon Capture and Storage – Progress and Next Steps, in support of the 2010 G8 Summit. http://www.iea.org/papers/2010/ccs_g8.pdf
- CBO has published Using Biofuel Tax Credits to Achieve Energy and Environmental Policy Goals. The study concluded that grain ethanol subsidies resulted in a cost of "about $750 per metric ton of CO_2-eq" reductions, and "about $300 per metric ton of CO_2-eq for biodiesel." [Readers may recall that EPA's analysis of H.R. 2454 calculated an allowance price ranging from $16/ton CO_2 to $100/ton CO_2 for the period 2012 to 2050.]
- EIA has published its 2010 International Energy Outlook. Among the many projections is one forecasting global coal consumption, now at about 130 Quads per year, to increase to about 200 Quads per year in 2035. Essentially all of the growth is in "non-OECD Asia" (China & India). http://www.eia.doe.gov/oiaf/ieo/index.html
- Bloomberg New Energy Finance has published Crossing the Valley of Death, a report on financing issues related to new, relatively high risk, low emission technologies. http://bnef.com/free-publications/white-papers/ NOTE: Bloomberg has also published a graphical "supply curve" with the relative cost of options to reduce U.S. GHG emissions, up to about 35% below 2005 levels.
- RFF has published a report, Toward a New National Energy Policy: Assessing the Options, which assesses options for a new energy policy. The report views the problems of excessive oil imports and climate change through an economist's prism, and offers a range of measures to reduce these problems, including a number of tax options. RFF appears to favor a C&T approach to climate, but states that a "Clean Energy Portfolio Standard" [perhaps similar to S. 3464 cited above] "does reasonably well." Options for the transportation sector include LNG for heavy

trucks. Each option is explained and scored in terms of carbon reduction, cost, and cost-effectiveness. The report is valuable because it encourages the reader to think beyond his preconceived (and probably limited) scope of policy options. http://www.rff.org/toward-a-new-energy-policy

- The IEA has published Carbon Capture and Storage: Progress and Next Steps, a report to support the June 26 G8 Summit in Muskoka. The report cites $26 billion in government support for CCS demonstration projects, and states that greater support is needed to meet the G8's goals for CCS deployment by 2020. NOTE: The Muskoka meeting is expected to focus on nuclear terrorism issues, and possibly Iran's nuclear ambitions. http://www.iea.org/papers/2010/ccs_g8.pdf
- IEA has just released Energy Technology Perspectives – 2010. The 700p. report appears to be an update and extension to IEA's ETP-2008 report. The report cites the importance of CCS technology (the largest contributor to 2050 emission reductions after energy conservation) and calls for a 2-5 fold increase in public sector funding of advanced technologies. http://www.iea.org/
- As noted previously, BP published its 2010 report on world energy use (covering 1999-2009). It is available at: http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2010_downloads/statistical_review_of_world_energy_full_report_2010.pdf .
- MIT has published another in its series of energy reports, this one called The Future of Gas. The report paints a very positive future for natural gas use in the U.S., and recommends replacing coal fired power plants with natural gas systems. http://www.nytimes.com/cwire/2010/06/25/25climatewire-mit-researchers-see-natural-gas-as-the-choic-68486.html A contrarian view almost immediately was posted by Energy-Facts.org, which claims that the MIT report ignores "far-reaching impacts on air, land and water" from production of (unconventional) shale gas. The site also suggests that production of shale gas can lead to greater GHG release than the ultimate combustion of the gas as fuel. http://www.energy-facts.org/