



December 7, 2009

## *Sequestration News*

The two major items this week are the DOE selection of CCPI projects and the Copenhagen Climate Conference. With the recent announcements on DOE CCPI demonstration projects, DOE investment in CCS technology leads the world by a large margin. From a climate viewpoint, the big news this week is the Copenhagen Climate Conference. This issue, in a separate section, provides expanded background information on the Copenhagen Climate Conference that was first mentioned in the last *Sequestration News*, as well as related news items.

### *Major DOE Commitment to CCS*

On December 4<sup>th</sup>, DOE announced the selection of winners of the CCPI-3 competitive solicitation for clean coal demonstration projects integrated with CO<sub>2</sub> capture and storage or re-use. Three projects valued at \$3.18 billion were selected. Up to \$979 million of federal funds will be provided to complement \$2.2 billion in private sector funds for projects proposed by American Electric Power, Southern Company Services, and Summit Texas Clean Energy. Information on each of these projects can be found at <http://www.energy.gov/news2009/8356.htm>. These projects are in addition to the two CCPI-3 projects previously selected by DOE with Hydrogen Energy and Basin Electric with a total value of about \$2 billion. They are also in addition to \$1.4 billion (plus matching funds) for Industrial CCS projects and approximately \$1 billion (plus private cost share) for the FutureGen project that DOE is pursuing. If DOE's planned R&D investments for CCS and related technologies over the next ten years are included in the total, the total value of the U.S. investment in CCS and related technologies will exceed \$10 billion.

### *Senate Climate Related Actions*

On December 3<sup>rd</sup>, Senator Kerry introduced legislation related to international climate finance and investment, reflecting areas under the jurisdiction of the committee he chairs (Senate Foreign Relations). This 81 page Bill would direct U.S. resources to reduce foreign deforestation and pay for climate mitigation technology deployment and adaptation measures in developing nations. Given that no markup or hearings are scheduled on the bill, its immediate purpose appears to be to suggest a position at Copenhagen, where a major issue will be how much money developed countries will provide to developing countries.

[http://kerry.senate.gov/cleanenergyjobsandamericanpower/pdf/SFRC\\_Climate\\_Bill.pdf](http://kerry.senate.gov/cleanenergyjobsandamericanpower/pdf/SFRC_Climate_Bill.pdf)

### ***Congressional Hearings Related to Climate and CCS***

The House Agriculture Committee held hearings on December 2nd and 3rd on the impact of climate legislation on agriculture. The Administration testified that the legislation would be net-beneficial to farmers. <http://agriculture.house.gov/hearings/statements.html>

The Senate Energy & Natural Resources (E&NR) Committee held a hearing on international aspects of Climate Change mitigation on November 17th. Testimony and an archived webcast can be reviewed at: [http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing\\_ID=da3ed941-e505-d8be-a4c1-13bd38e3e42b](http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=da3ed941-e505-d8be-a4c1-13bd38e3e42b)

The Senate E&NR Committee also held a hearing on December 2nd to explore policy options for reducing GHG emissions. Some participants suggested reconsidering a carbon tax, or a sector-specific (e.g., power plants) C&T program, versus an economy-wide C&T program. <http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.ByMonth>

The Senate Finance Committee held a hearing November 10th on the impact of climate legislation on jobs. Testimony by witnesses is available at: <http://finance.senate.gov/sitepages/hearing111009.htm>

### ***EPA and CCS***

On December 2nd, the Competitive Enterprise Institute petitioned EPA to delay issuance of its Endangerment Finding (expected to be issued this week or next). From the opposite direction, on the same day, a group called "350.org" and the Center for Biological Diversity petitioned EPA to use current authorities to issue a positive Endangerment Finding, issue air quality criteria for long-lived GHGs, and then issue National Ambient Air Quality Standards for those GHGs.

### ***Scotland & CCS***

Scottish Power has announced that tests at the prototype carbon capture unit at Longannet Power Station have resulted in a major breakthrough in reducing the amount of energy required to separate carbon emissions from a coal-fired power plant. (November 29, 2009) Scottish Power and Aker Clean Carbon have been able to demonstrate reduction in the energy requirement in an improved capture process by about a third from a reference plant. The focus for the tests at Longannet has been to reduce this load to a minimum via a combination of process improvements and low energy solvents. The improved process has been successfully verified in the pilot plant, with the energy required being reduced by approximately a third. The prototype carbon capture unit is the first of its kind to be demonstrated on a working coal-fired power station in the UK, and has been successfully operating for over 2000 hours.

[http://www.oilvoice.com/n/Major\\_Breakthrough\\_for\\_ScottishPower\\_Carbon\\_Capture\\_Prototype\\_at\\_Longannet/01249bc9f.aspx](http://www.oilvoice.com/n/Major_Breakthrough_for_ScottishPower_Carbon_Capture_Prototype_at_Longannet/01249bc9f.aspx)

### ***Holland & CCS***

The Dutch government has approved the experimental below-ground storage of excess CO<sub>2</sub> to curb damaging emissions, dismissing concerns of residents who live on top of the project. (November 18, 2009) The test project would start in 2012 with CO<sub>2</sub> stored in a spent natural gas field with a capacity of 0.8 megatons underneath the eastern town of Barendrecht, a government statement said. "After the

CO<sub>2</sub> has been stored there for several years, an evaluation will be done," it said. "Only if no problems have arisen by then will authorization be given for storage at a second, larger field... with a capacity of nine megatons." Shell plans to capture and store at Barendrecht CO<sub>2</sub> emitted from its refinery at the Port of Rotterdam. The project, the total cost of which was not revealed, will be subsidized by the Dutch state to the tune of 30 million euros. The municipality of Barendrecht, provincial authorities and inhabitants, concerned about the risk of explosion and earth movement, are opposed to the project and vowed to continue to resist it. The Netherlands, it said, had a storage capacity of some 800 megatons under land and another 800 megatons under sea. "This will allow us to store 40 megatons per year for 40 years, the equivalent of 20% of our current annual CO<sub>2</sub> emissions."

[http://www.google.com/hostednews/afp/article/ALeqM5i0gwwjN8hkEa1SyfHo\\_b7LhZ3z2A](http://www.google.com/hostednews/afp/article/ALeqM5i0gwwjN8hkEa1SyfHo_b7LhZ3z2A)

## ***Copenhagen Climate Conference Section***

### ***U.S. and Climate Conference***

As indicated in the last issue of Sequestration News, the White House announced that President Obama will travel to Copenhagen on December 9th to participate in the United Nations Climate Change Conference. The White House also announced that in the context of an overall deal in Copenhagen that includes robust mitigation contributions from China and the other emerging economies, the President is prepared to put on the table specific U.S. emissions reduction targets. Reporting from the Copenhagen Conference can be obtained at <http://unfccc.int/2860.php>.

President Obama and other world leaders announced in mid-November that they supported delaying a legally binding climate pact until 2010 or even later. (November 15, 2009) European negotiators said the move did not imply weaker action. Some argued that legal technicalities might otherwise distract the talks in Copenhagen and it was better to focus on the core issue of cutting climate-warming emissions. Danish Prime Minister Lars Lokke Rasmussen said the December 7-18 talks should still agree on key elements such as cuts in greenhouse gases for industrialized nations and funds to help developing nations. Danish and Swedish officials said they wanted all developed countries including the U.S. to promise numbers for cuts in emissions in Copenhagen. The aim of the summit is to set ambitious targets for cutting greenhouse gases in industrialized nations, but also to raise funds to help poor countries slow their own emissions growth and tackle the worst impacts on crops and water supplies. Despite the talk in Singapore of urgent action on climate change, a statement issued after the 21-member Asia-Pacific Economic Cooperation (APEC) summit dropped an earlier draft's reference to halving greenhouse gas emissions by 2050. It was not clear if China, now the world's biggest carbon emitter, had backed the two-stage proposal in Singapore. <http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE5AE0E420091115?sp=true>

### ***India & Climate Issues***

India rejected a Danish draft proposal on climate change which proposed a cap on global emissions. (December 1, 2009) This rejection widened the gulf between rich and poor nations ahead of next week's talks. The media reported that the Danish offer set 2025 as a deadline for all countries to cap their emissions irrespective of current levels, essentially blurring the line between the developed world and countries that are still industrializing. In an interview on the CNN-IBN news channel, Environment Minister Jairam Ramesh said the draft proposal "clearly is unacceptable to us." India has argued that any cap on emissions growth would hamper its rapid economic expansion, which relies on fuels like coal. India and China are working together on a draft of an negotiating framework that is more acceptable to

them. Chinese climate change envoy Xie Zhenhua will soon submit the draft to Denmark. Minister Ramesh added that India stood firm with China, South Africa and Brazil "as far as negotiations are concerned." Climate envoys from the four developing countries met in Beijing, reiterating their position that developed countries must shoulder most carbon emissions cuts.

[http://news.yahoo.com/s/afp/20091201/wl\\_sthasia\\_afp/unclimatewarmingindiadenmark;\\_ylt=AhUsgFBTMoFC2E55qYeyZK\\_POrgF;\\_ylu=X3oDMTJxcjA1YTdwBGFzc2V0A2FmcC8yMDA5MTlwMS91bmNsaW1hdGV3YXJtaW5naW5kaWFkZW5tYXJrBHBvcwMzMwRzZWMDDeW5fc3ViY2FOX2xpc3QEc2xrA2luZGlhcmVqZW](http://news.yahoo.com/s/afp/20091201/wl_sthasia_afp/unclimatewarmingindiadenmark;_ylt=AhUsgFBTMoFC2E55qYeyZK_POrgF;_ylu=X3oDMTJxcjA1YTdwBGFzc2V0A2FmcC8yMDA5MTlwMS91bmNsaW1hdGV3YXJtaW5naW5kaWFkZW5tYXJrBHBvcwMzMwRzZWMDDeW5fc3ViY2FOX2xpc3QEc2xrA2luZGlhcmVqZW)

Union Minister for Environment and Forests Jairam Ramesh asserted in late October that "India will walk out" of the Copenhagen Climate Change summit if the Western world insisted on enforcing any kind of legal bindings on emission trajectory. (October 20, 2009) He charged European nations with adopting a fundamentalist approach, which was destroying the Copenhagen agenda. "There is no question of monitoring, reporting and verification (MRV) for domestic projects and actions. We are open to this idea for internationally funded projects... something. There is no weakening of India's position and our initiatives will only give us the required strength to negotiate in the international forum," Mr. Ramesh told journalists here after launching a refurbished website of the Ministry. Mr. Ramesh said MRV for domestic projects was totally unacceptable. "Where we are getting international finance and technology, we can certainly consider a role for MRV. That's reasonable. But MRV is certainly not agreeable for our National Action Plan for Climate Change," he said. Mr. Ramesh said that for India adaptation measures were more fundamental than mitigation.

<http://www.hindu.com/2009/09/30/stories/2009093060311000.htm>

### ***Australia & Climate Issues***

Australia's Senate has rejected a bill on the government's climate change policy for a second time. (December 1, 2009) Two opposition senators crossed the floor, but it was not enough to secure passage of the Emissions Trading Scheme (ETS) to reduce greenhouse gases. The vote came a day after the opposition Liberal Party ousted their leader, Malcolm Turnbull, who had promised to back the bill. Deputy PM Julia Gillard said the bill would be resubmitted next year. Prime Minister Kevin Rudd had secured opposition backing from Mr. Turnbull, but his party revolted and replaced him with Tony Abbott. The bill was voted down by 41 votes to 33 in the Senate. Analysts had suggested Mr. Rudd could use the rejection of the bill as a legal trigger for a snap election – after which the bill could be passed at a special joint session of parliament. But Ms Gillard said that the government would resubmit the legislation to parliament early next year. The ETS is part of a package aimed at reducing Australia's carbon emissions by up to 25% below 2000 levels by 2020. <http://news.bbc.co.uk/2/hi/asia-pacific/8389909.stm>

### ***Austria & Climate Issues***

Austria is performing worse than any other major European economy in cutting emissions of climate-warming gases, according to an announcement by European Environment Commissioner Stavros Dimas in mid-November. (November 12, 2009) Fifteen long-standing EU member states are on track to outperform their combined target of reducing or offsetting carbon dioxide emissions by 8% under the United Nations' Kyoto Protocol. Austria will overshoot its Kyoto target by 12.9% even if it uses all the carbon offsetting mechanisms available according to the available information. The Austrian government only decided its strategy for cutting emissions in 2007, after 5 years of talks. Ireland, Italy, Portugal and Spain are also set to overshoot their Kyoto goals in terms of actual emissions, but the use

of offsets will bring them back in line. The 15 EU countries which were member states when the Kyoto Protocol was ratified are on track to cut emissions to 6.9% below 1990 by the 2008-2012 measurement period, short of their 8% goal, but aggressive use of offsets will result in reductions somewhere in the world of around 9%. Carbon offsetting allows companies, governments or individuals to pay for emissions cuts elsewhere, usually in poorer countries where such cuts are cheaper. Further measures such as reforestation programs will take them to around 13%. Dimas called for rich countries, such as Japan and the United States, to follow the EU's lead by committing to emissions cuts that would put them on track for a combined reduction of 30% by 2020.

<http://www.reuters.com/article/environmentNews/idUSTRE5AB3WX20091112>

### *UK & Climate Issues*

UK government plans to make carbon emission cuts of 80% by 2050 are physically impossible to achieve, according to a new analysis. (November 13, 2009) The Institution of Mechanical Engineers says there is not enough time or capacity to build the wind turbines and extra nuclear power stations required. Under current plans, the targets will not be met until 2100, it argues. The Department of Energy and Climate Change accused the institution of having a "can't do, won't do attitude". IMeche also called for a major investment in geo-engineering. It is calling for a "war" on climate change with a beefed up government department in charge. It could also mean the introduction of some form of carbon "rationing" for individuals to make people aware of how much energy they are consuming. The UK's Climate Change Act passed into law in 2008, putting a legal imperative on the government to cut emissions by 80% of their 1990 levels by 2050, with a mid-term target of 34% cuts by 2020. But the report investigates how practical these targets are to reach and concludes that they cannot be met with the current approaches to cutting carbon. They would not, in fact, be reached until the year 2100. According to the analysis, even if the UK managed to cut the demand for energy by 50%, it would still require an extra 16 nuclear power stations and 27,000 wind turbines by 2030 to be sure of hitting the target. Dr Tim Fox is head of environment and climate change at the Institution. He says that the problems of building the infrastructure haven't been thought through. A copy of the report can be found at: <http://www.imeche.org/about/keythemes/environment/Climate+Change/MAG> Story appeared on: <http://news.bbc.co.uk/2/hi/science/nature/8358077.stm>

British Prime Minister Gordon Brown called for the creation of a \$10 billion a year fund to help developing countries battle climate change. (November 27th) Brown offered the proposal during a meeting of Commonwealth leaders intended to build momentum for an agreement in global climate talks in Copenhagen. Under Brown's proposal, funds could be made available to poor countries as early as next year, well before any new climate deal takes effect. The EU has already looked at similar proposals for "fast-start" financing but has so far been unable to agree on a figure. Brown told a news conference on the sidelines of the summit in Trinidad and Tobago "What I'm proposing today is a Copenhagen launch fund. It would start in 2010. It would be \$10 billion per annum by 2012." The fund would run from 2010 to 2012, increasing to \$10 billion in the final year, under his plan. Britain is prepared to contribute 800 million pounds (\$1.31 billion) -- already set aside in Britain's budget -- over three years to the fund. Brown said he believed the EU and the United States would also be ready to contribute. EU leaders said last month that developing countries will need 100 billion euros (\$149 billion) a year by 2020 to battle climate change. Brown said half of the money in his proposed launch fund should go toward helping the poorest countries adapt to climate change. The other half would help countries deal with deforestation and building new, cleaner energy sources. Developing countries would have to provide part of the finance for projects to lessen the impact of climate change and

payment from the fund would depend on results. <http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE5AQ31220091127?sp=true>

Rich countries and developing nations fought over climate change, failing to make progress on financing ahead of a major environmental summit in Copenhagen. (November 8, 2009) Britain, which was hosting a meeting of G20 finance ministers in Scotland, was determined to push toward a \$100 billion deal to cover the costs of climate change by 2020. But talks got bogged down in a row with large developing countries about who should foot the bill. The climate change discussion had dragged on for hours and a French official said the debate was so intense there was a risk the final statement would not mention climate change at all. In the end, they agreed on the need "to increase significantly and urgently the scale and predictability of finance to implement an ambitious international agreement." European Union leaders agreed in October that developing countries would need 100 billion euros a year by 2020 to battle climate change. About 22-50 billion euros of the total will come from the public purse in rich countries worldwide and the EU is expected to provide between 20-30% of that. China is often denounced by Western critics as the main obstacle to agreement, because it argues developing countries should not submit to binding international caps on emissions while they grow out of poverty. In turn, China and other emerging powers have said the rich countries have done far too little in vowing to cut their own greenhouse gas output, and in offering technology and money to the Third World to help cope with global warming.

<http://www.reuters.com/article/environmentNews/idUSTRE5A60QQ20091109?sp=true>

### *Africa & Climate Issues*

African leaders agreed on how much money to demand from the rich world to compensate for the impact of climate change on the continent. (November 17, 2009) The United Nations summit in Denmark will try to agree on how to counter climate change and come up with a post-Kyoto treaty protocol to curb emissions. "We have set a minimum beyond which we will not go," Ethiopian Prime Minister Meles Zenawi, who will represent Africa at the talks, told reporters. But the details of the demand will be kept secret ahead of next month's Copenhagen talks. Exhaustive preparatory talks since 2007 have failed to solve splits between rich and poor countries or find extra funds to help developing nations to pay for expensive technology to ensure they do not over pollute as their economies grow. Poor nations want rich countries to cut emissions by 40% from 1990 levels by 2020. But some in the West complain that such cuts are not realistic, especially so soon after the global economic downturn. Meles -- who has threatened a walkout of the 52 African nations he will represent -- said his priorities at the talks would be to ensure carbon emissions are reduced and to secure a fair yearly compensation amount for Africa. The Ethiopian leader was speaking in Addis Ababa at a meeting of an African Union (AU) committee of 10 nations charged with agreeing a common position. Aid workers say a five-year drought, worsened by climate change, is afflicting 23 million people in east Africa, with Ethiopia worst affected. Kenya's President Mwai Kibaki and Ugandan President Yoweri Museveni also attended the last session the AU group will have before next month's talks. Meles said Africa wanted a treaty to be agreed in Copenhagen but could accept a "binding political agreement" as a steppingstone to a treaty being agreed later.

[http://af.reuters.com/article/ethiopiaNews/idAFLH62402920091117?feedType=RSS&feedName=ethiopiaNews&utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed%3A+reuters%2FAfricaEthiopiaNews+%28News+%2F+Africa+%2F+Ethiopia+News%29&sp=true](http://af.reuters.com/article/ethiopiaNews/idAFLH62402920091117?feedType=RSS&feedName=ethiopiaNews&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+reuters%2FAfricaEthiopiaNews+%28News+%2F+Africa+%2F+Ethiopia+News%29&sp=true)

## *Copenhagen Climate Conference: Background Information*

The Copenhagen meeting was originally planned as the culmination of efforts to develop a successor agreement to the Kyoto Protocol which codified a binding commitment by a group of signatory nations who agreed to specific reductions of greenhouse gas (GHG) emissions during the first budget period, from 2008 – 2012. The framework for these negotiations emerged from the many meetings held under the UN banner, through other multi-lateral initiatives – such as the G-8, the G-20, the Asian Pacific Economic Cooperation – and various bilateral efforts

Copenhagen was originally intended to produce a binding agreement for the period from 2012 forward. It is widely anticipated that no such binding agreement will emerge from this meeting. Success at Copenhagen is likely to be judged in terms of whether a commitment has been made to move toward a global low carbon economy, an agreement of mechanisms to be used to achieve this goal, and announcement of financial support to help the most vulnerable nations adapt to a changing climate.

Globally, the nations break into a number of interest groups depending upon which issues are important to them and whether they would be subject to restrictions or are donors or receivers of financing that would be required to implement any plan of action. Australia recently rejected an emission trading system for the second time. The EU and other nations that have ratified Annex 1, particularly the original member states, are seeking to obtain binding commitments from other nations that would validate the policies and procedures already in place within the EU – measures that are both causing major structural changes in the energy sector within those economies and are generating internal concerns about rising prices for energy and industrial flight to countries without such policies. Canada and Australia are struggling to create national frameworks that could lead to binding commitments and that put in place the essential mechanisms to ensure compliance with those commitments. Other developing nations with an historic reliance on fossil fuels or with aggressive programs to exploit their natural resources (forests and fossil fuel reserves) are unwilling to assume firm reduction goals or to transition to lower emitting but more costly technologies without substantial help from the developed world. Finally, the less developed countries and the small island states are seeking significant financial and technical assistance to adapt to the consequences of the climatic changes that many claim are inevitable.

These interest groups, singly or together, have input their positions as Parties to the UN Framework Convention on Climate Change (UNFCCC), on seven topics that would form the outline of a new international treaty on climate change. The seven topics are:

- (1) measurement, reporting and verification (MRV) of Quantified Emission Limitation and Reduction Objectives (QELROs);
- (2) a shared vision of responsibilities, rights, and capabilities;
- (3) legal aspects of proposals for an agreed outcome including penalties for failure to comply;
- (4) creating mechanisms to finance mitigation and adaptation activities particularly to assist the least developed countries (LDCs);
- (5) which adaptation activities receive funding and who controls both the funds and oversight on whether adaptation efforts are “successful”;
- (6) policies for technology transfer, funding for technology transitions and intellectual property issues;
- (7) architecture of the agreement including its relationship to previous accords.

The submissions of these various nations, groups of nations, and NGOs are well summarized in a World Resources Institute document: Summary of UNFCCC Submission, August 2008 – October 2009, which can be found at: <http://www.wri.org/publications/2284>

### **Mitigation Aspects Background Information:**

Mitigation is obviously a major issue. The procedural question includes both what sort of binding reduction targets to which any nation would commit; which measures would be established in national policies (including taxes, cap-and-trade, subsidies, etc.); and, how might these policies impact international trade. For example, several nations have proposed policies to tax goods imported from countries that do not follow sufficiently strict emission reduction regimes. Any binding agreement or process that might emerge from Copenhagen would need to address verifiable national/international action, including the consideration of:

- Measurable, reportable and verifiable mitigation commitments or actions by all developed countries, and;
- Mitigation commitments by developing countries that are supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner.

Consistent with the UNFCCC, all Parties have agreed to undertake efforts to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system. A key concept within the Framework Convention is the principle of ‘common but differentiated responsibilities and capabilities’, that is, commitments for developed countries are different than those for developing countries. A number of possible tools and rules are being considered for assisting developed countries to reach their reduction commitments, such as:

- Global emission trading system and/or consistent rules on what constitutes a valid and fungible emission reduction which would allow multiple independent carbon markets to operate;
- Further refinement of project based mechanisms (such as the Clean Development Mechanism);
- Land use, land-use change and forestry (LULUCF) largely focused on reducing deforestation (REDD);
- Greenhouse gases, sectors and source categories to be covered or excluded (black carbon for example);
- Establishing a sectoral approach for energy intensive industries – that is setting specific targets for specific sectors such as the steel, aluminum, cement and paper and pulp sector world-wide which would place restrictions on GHG emissions from these industries no matter in which country the emissions were generated.

### **Background Information on REDD:**

“Reducing emissions from deforestation in developing countries” (REDD) is a complimentary mitigation approach to climate change abatement, given that deforestation contributes up to 20% of global CO<sub>2</sub> emissions. In the recent series of meetings leading up to Copenhagen, Parties to the UNFCCC affirmed the need to take further meaningful action to reduce emissions from deforestation and forest

degradation. They adopted a work program to further methodological work, and agreed to undertake efforts, including demonstration activities, to address the drivers of deforestation.

### **Adaptation Background:**

Besides mitigation, adaptation is the other central approach toward dealing with climate change. Impacts of climate change are already being identified and are projected to intensify over time in line with the predicted rise in global temperature. Droughts, floods, extreme weather conditions and sea level rise, all likely consequences of projected temperature increases, would seriously harm economies and societies worldwide. Developing countries, especially the Least Developed Countries (LDC's) and Small Island Developing States (SIDS) – also identified by some of members of AOSIS (Alliance of Small Island States), are the most vulnerable to these risks.

The UNFCCC commits all Parties to formulate, implement, publish and update adaptation measures, as well as to cooperate on adaptation. By undertaking National Adaptation Programs (NAPA's), Least Developed Countries can assess their adaptation needs. Mechanisms to fund adaptation actions across the globe are proliferating. There have been a number of proposals to create mechanisms to pay for adaptation – including actions arising from most recent G-20 meeting – through creation of global funds to which any and all nations can contribute. Starting with the UNFCCC meeting in New Delhi, adaptation has been highlighted as one of the most important elements of a long-term climate change agreement.

### **Technology Background:**

Sound technologies either for mitigation and adaptation are recognized as being at the core of any solution to climate change. Therefore, promoting technology transfer and cooperation has become a key aspect of negotiations toward a binding global agreement. Just as funding for adaptation is a key demand from developing countries, so are rules that facilitate technology transfer and cooperation and that provide funding to offset the higher costs of such technologies.

### **Finance Background:**

The current levels of funding available under the Convention have been criticized as being insufficient to address the climate change challenge. It has been argued that there is a need for additional investment and financial flows to stimulate green economic growth worldwide and to cope with the impacts of climate change, particularly to address needs of the developing countries. The UNFCCC has issued a series of reports over the past few years to review, analyze and assess the necessary investment and financial flows in 2030 to meet worldwide mitigation and adaptation requirements. One of the key findings of the 'Financial Flows Report' (2007) is that in 2030 additional investments and finances of USD 200-210 billion are required to return global greenhouse gas emissions to current levels by 2030. The review also found that additional investment and financial flows for adaptation in 2030 amount to several billions of USD.

Means to provide increased funding that have been suggested include carbon markets and enhancing the Clean Development Mechanism (CDM), which permits industrialized countries to invest in emission reduction projects in developing countries and thereby generate tradable emission credits, already shows a significant potential to leverage domestic and international investments. Carbon capture and storage (CCS) has been precluded from the CDM to this point. However, there is significant interest in including this technology particularly when applied to natural gas production. The modest number of

such projects and their probable location – in Africa – may result in this application of CCS to be accepted for consideration by the CDM Board.

On the other hand, there have been a number of studies pointing to serious flaws in the mechanisms currently available – including charges of outright fraud. Several of the leading certifying organizations for CDM projects have temporarily lost their “license” to certify allowances to the UN due to poorly trained staff or questionable practices. The current global financial crisis has also seriously reduced efforts to develop these financial mechanisms in the short term and has shifted attention away from such questions to those focused on financial crises within the major lending nations. It may be difficult to developed nations to provide sufficient financial incentives at this time to secure emission reduction commitments from developing countries at this time – further suggesting a delay in creating a new binding global agreement.

### **Useful web links with daily coverage of events leading up to and during the Copenhagen meeting:**

1. UN FCCC web site: <http://unfccc.int/2860.php>
  - Remote participation tools:  
[http://unfccc.int/meetings/cop\\_15/virtual\\_participation/items/5092.php](http://unfccc.int/meetings/cop_15/virtual_participation/items/5092.php)
  - This site includes a soon to be available option for webcasts, etc.:  
UNFCCC Live and On-demand webcast from COP 15 (coming)
  - The host organizations and the Danish government also operate a web site with updates and news items: <http://en.cop15.dk> and  
<http://www.copenhagenclimatecouncil.com/get-informed/climate-negotiations-updates.html>
  
2. WRI has a slate of summaries and reports relevant to both positions announced going into the negotiations and discussions of the impact of the various positions and pledges. See: <http://www.wri.org/project/cop-15>
  
3. Any number of law firms and NGO’s will be running daily blogs and other web - based communications (including web-casting selected side events) throughout the UNFCCC meeting. The firm Norton Rose has covered the various climate meetings in considerable detail: <http://www.nortonrose.com> and in particular:  
<http://www.nortonrose.com/keystrengths/energyinfrastructure/insightintoclimatechange/expertise12804.aspx?lang=en-gb>
  
4. Newspapers and News services will be covering the conference closely. The Guardian in the U.K. typically devotes a lot of attention to these meetings. They already have a web site that covers the run up to the meeting:  
<http://www.guardian.co.uk/environment/copenhagen>

The Clean Skies Network plans to offer extensive coverage of Copenhagen at:  
<http://www.cleanskies.com/special-reports/United-Nations-Climate-Change-Conference-Copenhagen-2009>

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*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.*