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04/09/2001 05:25:04 PM

Record Type: Record





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Subject: Draft Materials on Climate Change

John - I am forwarding to you draft materials on climate change. Tom Gibson and John Beale have reviewed these documents. They include:

- a 2-page summary of the findings of Dr. James Hansen
- a 2-page summary of the positions/views of key domestic stakeholders
- a summary of congressional activity. There are two files: the first ("Congressional Activity") is a summary of activity in the 107th Congress; the second (Congressional Activity 2) includes a summary of some agriculture-related climate bills from the 106th Congress that haven't (to the best of our knowledge) been introduced in the 107th (yet) -- we can reconcile the two documents if you like -- just let me know. We have also shared this information with the State Department.

(See attached file: Hansen.doc) (See attached file: stakeholder0409.wpd) (See attached file: Congressional Activity.wpd) (See attached file: Congressional Activity 2.wpd)

P.S. We sent this afternoon approx. 15 various "source maps" of ghg emissions to Richard Russell at OSTP.

-  - Hansen.doc
-  - stakeholder0409.wpd
-  - Congressional Activity.wpd
-  - Congressional Activity 2.wpd

Summary of Dr. James Hansen's Findings

Basic Concepts

- Climate and temperature on earth are determined by the balance of the amount of energy coming in from the sun and the amount leaving the planet through various processes¹. Over time, the balance fluctuates, and this results in a natural variation in climate and temperature.
- Events or processes that cause this overall energy balance to shift are said to "force" a change in climate – and this can be towards warmer or cooler conditions. A change that causes more energy to accumulate than leaves the earth represents a "positive" forcing, or warming.
- Examples of such climate "forcing" include: 1) a change in the sun's brightness, which could increase or decrease the energy reaching earth; 2) a volcanic eruption, which can blanket the globe with small "white" particles -- these particles reflect sunlight back into space, shifting the balance to less energy at the earth surface, and cooler conditions – a "negative forcing"; 3) an increase in CO₂, which impedes the process by which the earth cools itself, leading to a "forcing" towards warmer conditions.
- There can be a delay of years to decades between a "forcing" event and an observed change in climate. This is because it takes a long time to change the temperature of the oceans. During the delay, the earth is warming, but there is much less apparent rise in the air temperature we encounter.

The Relative Importance of CO₂ vs. other Greenhouse Gases and Particles

- Hansen presents estimates of the relative effect on the earth's energy balance (climate forcing) of a variety of substances. While the single most important substance for warming is CO₂, the combined effect of the other greenhouse gases (methane, CFC's, tropospheric ozone, and nitrous oxide) is larger than CO₂.
- The second most important warming contributor, however, is not a greenhouse gas, but black carbon particles (soot). Black carbon absorbs sunlight, warming the atmosphere.
- Other fine particles, notably sulfates and nitrates, have the opposite effect, that is they cool the earth by reflecting sunlight back into space. The net cooling ("negative forcing") by these substances is uncertain, but substantial.

¹ The main such process for cooling the earth is simply radiating heat from the earth's surface back into space. Clouds and water bodies actually reflect light back into space, which reduces the amount of sun energy that stays with the planet.

- Hansen sums up the effects of all of these substances in modeling climate between 1950 and 2000. The results are consistent with observations. Based on these calculations, Hansen estimates that we can expect at least another half degree C temperature increase from current loadings of gases and particles.

Policy Implications: A Need for Limits on Methane and Conventional Air Pollutants

- Hansen forecasts the results of a "business as usual" scenario (no new climate controls) as resulting in an additional increase of 1.5 C by 2050 and "several degrees" by 2100.
- He also examines an "alternative scenario" that would cut the temperature increase by 2050 in half compared to business as usual. The components of this strategy are:
 - *Limit the growth in CO₂ emissions to recent rates for the next 50 years.* This would require active measures, e.g. energy conservation, but would not freeze or roll back CO₂ to e.g. 1990 levels.
 - *Reduce methane.* Reductions in methane taken today are fully achieved within about a decade, much quicker than for CO₂. Holding methane at 1990 levels offers the same benefits in 2050 as holding CO₂ to that level.
 - As Hansen notes, substantial cost-effective reductions are possible for methane, for sources such as pipeline leaks and coal mines. Many of these technologies save energy and increase productivity.
 - *Stop growth in tropospheric ozone and black carbon.* On a global scale, ozone levels are about 2 to 4 times higher than pre-industrial times. Therefore, reductions on this scale appear feasible. Global scale reductions of nitrogen oxides (NO_x)², methane and other hydrocarbons would be the main strategies.
 - The principal sources of black carbon are incomplete combustion of fossil fuels, such as diesels and coal, and "biomass" burning such as wildfires and agriculture, and poorly controlled stationary sources.
 - Current and planned programs in the developed world are reducing ozone and particles. Similar actions by developing countries would greatly improve human health locally and slow climate change. The climate benefits are partially offset by the reduced cooling from "white" particle reductions.
- The immediate benefits of the methane and air pollution controls would be overcome in time by the continued growth in CO₂. Hansen stresses that at some point in the future, the growth in CO₂ will have to be reversed.

² Ozone is a greenhouse gas. The NO_x controlled under air pollution programs is not itself a greenhouse gas, but a precursor to ozone formation.

Views of Key Domestic Stakeholders

Business and Industry

- Agriculture - The Farm Bureau, initially skeptical of agriculture and forestry options in the Kyoto Protocol, is now supportive of carbon sequestration projects in response to interest from the farm community.
- Automotive - While opposed to the Kyoto Protocol, Ford, GM, and DaimlerChrysler have announced production plans for hybrid gas and electric vehicles in 2003 or 2004 (Honda and Toyota have already produced such vehicles). All three major U.S. auto manufacturers have also pledged to increase the fuel economy of their SUVs by at least 25% by 2005.
- Chemical - While opposed to the Kyoto Protocol, the American Chemical Council supports voluntary programs and actions by members to improve energy efficiency and reduce greenhouse gas emissions.
- Utilities - The Edison Electric Institute, the largest association of shareholder owned electric power companies, is actively engaged in Climate Challenge, a voluntary partnership with DOE for reduction of greenhouse gas emissions. EEI has opposed the Kyoto Protocol because it would do harm to the US economy and excludes developing countries -- but has also been a leading proponent of flexibility mechanisms.
- Over 7,000 organizations are participating in EPA's voluntary programs such as Energy Star.
- Several major corporations -- Ford, DaimlerChrysler, BP Amoco, Sunoco, Shell -- have withdrawn from the Global Climate Coalition, a lobbying group opposed to international action on climate change. Some have joined organizations (e.g., the Pew Center on Global Climate Change and the Business Council for Sustainable Energy) that advocate comprehensive policies to address climate change.
- Examples of companies with corporate goals to reduce GHG and energy emissions:
 - BP Amoco: reduce greenhouse gas emissions to 10% below 1990 levels by 2010.
 - Shell: reduce greenhouse gas emissions to 10% below 1990 levels by 2002.
 - Dow: reduce energy use by 20% per unit of production by 2005.
 - DuPont: reduce greenhouse gas emissions 65% below 1990 levels by 2010, and use renewable resources in 10% of its global energy use by the same year.
 - United Technologies: reduce energy and water use 25% below 1997 levels by 2007, based on sales-weighted emissions.
 - World Semiconductor Council: reduce PFC emissions 10% below '95 levels by 2010.

NGOs and Trade Associations

- Several consumer and policy NGOs (e.g., Greening Earth Society, Cooler Heads Coalition, Global Climate Coalition) are concerned about the use of what they perceive as inconclusive climate science as a basis for making policy decisions. Generally, they are opposed to regulation of greenhouse gases and/or U.S. ratification of Kyoto.
- Environmental groups believe that scientific findings such as those of the Intergovernmental Panel on Climate Change (IPCC) demand a concerted international

response to deal with greenhouse-gas emissions. These groups (including Greenpeace, Sierra Club, and World Resources Institute) generally favor Kyoto ratification and the implementation of domestic programs for the regulation of greenhouse gases.

- A number of centrist coalitions promote ongoing assessment of climate-change science as well as U.S. engagement in international negotiations. These organizations do not necessarily support ratification of the Kyoto Protocol, but rather the use of energy conservation, alternative or renewable energy sources, and efficient technologies. Such groups include the Pew Center on Global Climate Change and the International Climate Change Partnership.

State and Local Governments

- To date, thirty-five states have completed greenhouse gas emission inventories. Twenty-six states have initiated state-based action plans to reduce greenhouse gas emissions.
- Some states are using market-based mechanisms to achieve reductions. For example, NJ has established a 3.5% statewide reduction goal and is working on a GHG trading agreement with The Netherlands; OR and MA have carbon offset requirements for new power plants; PA is purchasing green power for 5% of its total electricity need.

Religious Community

- The National Religious Partnership for the Environment (U.S. Catholic Conference, National Council of Churches of Christ, Evangelical Environmental Network, Coalition on Environment and Jewish Life) believes that it is every citizen's moral and religious responsibility to be stewards of God's creation and to protect the health and habitat of the global environment against the threats of global warming.
- The Interfaith Council for Environmental Stewardship questions the science of climate change and believes that sickness and poverty are more critical than global warming.
- The Interfaith Global Warming Campaign has local initiatives in at least 18 states to reduce climate change impacts.
- The Interfaith Center on Corporate Responsibility, which oversees more than \$100 billion in pension funds, urges corporations to invest in energy efficiency to profitably reduce global warming emissions.
- Over 470 congregations have joined EPA's voluntary Energy Star program.

Organized Labor

- Several labor organizations have taken positions against the Kyoto Protocol. The AFL-CIO adopted a resolution in 1997 opposing this treaty because of concerns related to its economic impact and lack of developing country participation. Within the AFL-CIO, the United Mine Workers have been the most active organization. In January, the International Brotherhood of Teamsters adopted a resolution opposing the Kyoto Protocol, calling instead for the development of a comprehensive energy strategy to ensure an adequate U.S. energy supply.

Recent Proposed Legislation

Act/Bill	Short Title	Sponsors	Date
S. 3260	Conservation Security Act of 2000	Harkin (Smith, Johnson, Kerrey, Daschle, Leahy)	Oct. 19, 2000
H.R. 5511		Minge (Baldacci, Berry, Boehlert, Clayton, Cooksey, Edwards, Farr, Hill, Hooley, Kind, Peterson, Pomeroy, Thune, Bereuter, Bishop, Boswell, Condit, Delahunt, Emerson, Gutknecht, Hinchey, Kaptur, Oberstar, Phelps, Sawyer, Wynn)	
<p>Goals: To amend the Food security Act of 1985 to establish the conservation security program. Offers compensation to farmers for voluntary conservation activities on land in agricultural production. To assist owners and operators to promote environmental benefits including "reduction of greenhouse gas emissions and enhancement of carbon sequestration."</p>			
Act/Bill	Short Title	Sponsors	Date
H.R. 2559	Agricultural Risk Protection Act of 2000		Jan. 24, 2000
<p>The Secretary shall use \$15 million to provide a grant to the Consortium for Agricultural Soils Mitigation of Greenhouse Gases, acting through Kansas State University, to develop, analyze, and implement carbon cycle research at the national, regional, and local levels.</p> <p>Establish the Biomass Research and Development Board to coordinate programs within and among departments and agencies of the Federal Government to promote biobased industrial product use by maximizing the benefits deriving from Federal grants and assistance; and bring coherence to Federal strategic planning.</p>			
S.2982	International Carbon Sequestration Incentive Act	Brownback (Dachle, DeWine, Kerry, Grassley, Byrd, Lugar)	July 27, 2000
<p>Goals: To enhance international conservation, promote carbon sequestration as a means of slowing the build-up of greenhouse gas emissions, and reward and encourage voluntary, pro-active environmental efforts on the issue of global climate change.</p> <p>Carbon sequestration investment credit of \$2.50 per ton of carbon sequestered for eligible taxpayers who undertake a carbon sequestration project outside of the United States.</p>			

S. 2540	Domestic Carbon Storage Incentive Act of 2000	Brownback (Kerrey, Murkowski)	May 10, 2000
<p>Goals: To amend the Food Security Act of 1985 to require the Secretary of Agriculture to establish a carbon sequestration program to permit owners and operators of land to enroll land in carbon sequestration program.</p>			
<p>Maximum annual rental payment may not exceed \$20 per acre and the Secretary may maintain up to 5 million acres of land in the United States in a carbon sequestration program at any 1 time during the calendar year.</p>			
S. 1066	Carbon Cycle and Agricultural Best Practices Act	Roberts (Murkowski, Grams, Hagel, Craig)	May 14, 1999
<p>Goals: To amend the National Agricultural Research, Extension, and Teaching Policy Act of 1977 to encourage the use of and research into best practices to improve the environment, and for other purposes.</p>			
<p>Carbon Cycle and Agricultural Best Practices Research: \$5 million Carbon Cycle and Remote Sensing Technology: \$5 million</p>			