Climate Change - Science

The sun's energy drives the Earth's weather and climate and heats its surface. Some of this energy radiates back into space, but some of it is trapped by greenhouse gases (carbon dioxide, water vapor and other gases). A natural "greenhouse effect" keeps the Earth warm enough for life to flourish, but if too much heat is trapped, the Earth's climate could change in disruptive and dangerous ways.

There is a growing scientific consensus that increasing emissions of greenhouse gases (GHG) are affecting the Earth's climate. That consensus is represented by the work of the Intergovernmental Panel on Climate Change (IPCC), a body established by the World Meteorological Organization and the United Nations to assess scientific, technical and socio-economic information relevant for the understanding of climate change, its potential impacts, and options for adaptation and mitigation.

The IPCC's Fourth Assessment Report, released in November of 2007, states, "Warming of the climate system is unequivocal, as is now evident from observation of increases in average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level." The report notes that eleven of the last twelve years (1995-2006) rank among the twelve warmest years of recorded temperatures (since 1850).

A key finding of the Fourth Assessment's 123-page "Summary for Policymakers" is: "Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases." A change from the previous report was the increased confidence in findings. "In terrestrial ecosystems, earlier
timing of spring events and poleward and upward shifts in plant and animal ranges are with very high confidence linked to recent warming. In some marine and freshwater systems, shifts in ranges and changes in algal, plankton and fish abundance are with high confidence associated with rising water temperatures, as well as related changes in ice cover, salinity, oxygen levels and circulation." Another finding on greenhouse gas (GHG) emissions is: "Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70% between 1970 and 2004."

On a positive note, the Summary states: "Both bottom-up and top-down studies indicate that there is high agreement and much evidence of substantial economic potential for the mitigation of global GHG emissions over the coming decades that could offset the projected growth of global emissions or reduce emissions below current levels." Charts and graphics in the report aid in understanding the complex scientific information presented.

In its Third Assessment Report published in 2001, the IPCC noted that the Earth's surface temperature has increased by about 1 degree Fahrenheit in the past century, with much of that warming occurring in the past two decades. The IPCC concluded that "In the light of new evidence and taking into account the remaining uncertainties, most of the observed warming over the last 50 years is likely to have been due to the increase in greenhouse gas concentrations." The IPCC also concluded that these increased concentrations are largely attributable to human activities that result in emissions of carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), halogenated fluorocarbons (HCFCs), ozone (O3), perfluorinated carbons (PFCs), hydrofluorocarbons (HFCs). Aerosols, including sulfate particles and black carbon (soot), are also believed to contribute to global warming.

For more information on the science of climate change, see:
Intergovernmental Panel on Climate Change
National Academy of Sciences, Testimony before the U.S. Senate Committee on Energy and Natural Resources, July 21, 2005
National Academy of Sciences, Testimony before the Subcommittee on Global Climate Change and Impacts, U.S. Senate

http://www.iaclimatechange.us/background-science.cfm
1 January, 2008

The Honorable Chester J. Culver and
The State of Iowa General Assembly
State Capitol Building
1007 East Grand Ave
Des Moines, Iowa 50319

Dear Governor Culver and Legislators:

Attached is the Interim Report of the Iowa Climate Change Advisory Council (ICCAC) which was established in the 2007 legislative session and signed into law by Governor Culver (SF 485). The law authorizes the ICCAC to submit a report to the Governor and the General Assembly on scenarios for reducing Iowa’s greenhouse gas emissions, and this Interim Report represents the early work of the Council and fulfills that requirement. The Council will continue its work and submit another report by December 31, 2008, providing an analysis of possible measures to be undertaken and the cost-effectiveness of those measures. We believe that Iowa can be a leader in addressing climate change, becoming more energy independent, and creating future economic opportunities.

Sincerely,

Jerald L. Schnoor, Chair
Iowa Climate Change Advisory Council

Jerald Schnoor, Chairman
Franklin Cownie, Vice Chairman
Ed Fallon, Secretary
James Burns
Roxanne Carisch
Richard Cruse
Jennifer Easler
Thomas Fey
Teresa Galluzzo
Marian Gelb
Thomas Hadden
Joanne Howard

Nile Lanning
Robert Loyd
David Miller
Richard Ney
Norman Olson
Julie Smith
Dawn Snyder
Roya Stanley
William Stigliani
Krista Tanner
Cathy Woollums

cc: Sen. John P. Kibbie, President of the Senate
Rep. Patrick J. Murphy, Speaker of the House
Sen. Joe Bolkcom
Richard Leopold, DNR Director
File ADM 6-2-004
In the 2007 legislative session, Governor Culver signed into law SF 485, which requires the development of a greenhouse gas (GHG) inventory and voluntary registry and also establishes the Iowa Climate Change Advisory Council (ICCAC). This Council is charged with identifying opportunities for Iowa to respond to the challenge of global climate change by becoming more energy efficient and energy independent while spurring economic growth.

The Council shall develop multiple scenarios designed to reduce statewide greenhouse gas emissions including one scenario that would reduce such emissions by fifty percent by 2050. The Council shall also develop short-term, medium-term and long-term scenarios designed to reduce statewide greenhouse gas emissions and shall consider the cost-effectiveness of the scenarios. The Council shall establish a baseline year for purposes of calculating reduction in statewide greenhouse gas emissions, and shall submit the proposal to the governor and general assembly by January 1, 2008. The Council may periodically adopt recommendations designed to encourage the reduction of statewide greenhouse gas emissions.

This report fulfills the first requirement to the Governor and General Assembly and outlines some operating procedures and the goals for multiple scenarios to be developed during 2008.

The Council is a broad-based group of Iowa stakeholders charged with making a comprehensive set of state-level policy recommendations to the Governor and General Assembly in a climate action plan. The Governor and the Iowa Department of Natural Resources (IDNR) have asked the Center for Climate Strategies (CCS) to assist the ICCAC in developing its recommendations. ICCAC members voted to endorse this request and role by CCS at its opening meeting on October 18, 2007, and on a subsequent ICCAC conference call meeting on November 15, 2007. To date the entire Council has met three times including a recent meeting on December 17 in Davenport at St. Ambrose University.

The Council has divided into five subcommittees with additional experts added as recommended by members. (Experts may vote on subcommittee matters as they arise, but subcommittee recommendations are vetted and voted by the full Council prior to being recommended to the Governor and General Assembly.) Council members must be present to vote. A majority of a quorum of twelve voting members is required to meet and decide on Council business. The Council seeks consensus in all its
recommendations, but when less than a consensus is achieved, it is reported as a supermajority of voting members (greater than 80%), or a simple majority (greater than 50%). In the case of simple majority votes, dissenting viewpoints are given voice in Council reports to the Governor and General Assembly. Subcommittees include Clean and Renewable Energy (Energy Supply); Energy Efficiency and Conservation (Residential, Commercial, and Industrial); Agriculture, Forestry, and Waste Management; Transportation and Land Use; and Cross-Cutting Issues. The subcommittees have been meeting in conference calls approximately twice per month. Here follows the Council recommendations to date:

1. The Council recommends multiple scenarios for state-wide reductions in greenhouse gases with targeted goals of 50% and 90% by 2050.
2. The Council recommends adopting a baseline year of 2005 for the purposes of calculating state-wide greenhouse gas emission reductions in future years.
3. The Council recommends adopting other baseline years for the purposes of economic opportunities and incentives as needed.
4. The Council recommends GHG reductions for interim years including 2012, 2020, and finally 2050.

Without our full analysis, it is clear to the Council that it is necessary to develop scenarios that slow, stop, and reverse the growth of Iowa's GHG emissions soon.

In 2008, the Council will continue its work on selecting GHG mitigation options and energy opportunities from a catalog of possibilities. Cost-effectiveness of these options will be evaluated. Policy options will be recommended by December 31, 2008 to the Governor and General Assembly that will position the state to address the climate change problem, become more energy independent, and create future economic opportunities.

Signed,
The Iowa Climate Change Advisory Council

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