

Iowa

Global Warming Solutions

Reducing Heat-Trapping Emissions in Iowa

A COMPREHENSIVE APPROACH

Reducing heat-trapping gases is essential, but cannot solve all the problems related to global warming. We must also minimize human pressures on our environment to reduce the severity of climate change impacts and the vulnerability of ecosystems to further stresses from climate change. Because some warming is inevitable, we also must anticipate and plan for the unavoidable impacts of change through long-term management strategies.

For more discussion of minimizing impacts on ecosystems and managing the effects of climate change, see **Confronting Climate Change in the Great Lakes Region: Impacts on our Communities and Ecosystems**, available at www.ucsusa.org/greatlakes.

Personal Solutions

The activities of the average Iowan resulted in 6.1 metric tons of heat-trapping emissions in 1990. Visit our website at www.ucsusa.org/iowa to find out what choices your family can make to reduce its global warming impact.

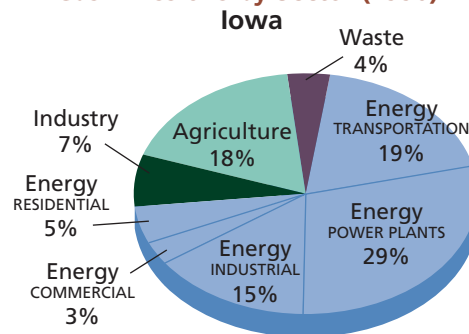
Our climate is changing because humans are adding large amounts of heat-trapping gases to the atmosphere. The good news is that practical solutions exist today to address this growing problem. While some warming is inevitable because past carbon dioxide (CO₂) emissions blanketing the earth will continue to have a warming effect for decades, the most extreme outcomes for Iowa can be avoided if responsible measures are taken locally, nationally, and elsewhere in the world now.

Many of the solutions to climate change provide immediate benefits, including energy cost savings, cleaner air and water, and new jobs. Ignoring climate change is not an option. Waiting 10 or 20 years or more to reduce emissions will increase the eventual severity, expense, and likelihood of irreversible losses—a terrible legacy to leave our children and grandchildren.

Tackling the Problem at the Source

To reduce climate change impacts, there is an important role for everyone: governments, businesses, farmers and individual families. Power plants and motor vehicles are the biggest sources of emissions in Iowa. Emissions from industry, businesses, and homes will also need to be reduced. In addition, improvements in agricultural and land use practices offer the potential for reducing emissions and storing carbon.

Total Heat Trapping Gas Emissions by Sector (1990)*



* The EPA's 1990 data provide the only complete greenhouse gas inventory for all sectors. Source: US EPA, 2003



© 2003 GE Wind Energy. All Rights Reserved.

Energy Solutions

Emissions from energy use in power plants, industry, businesses, and homes account for 53 percent of heat-trapping emissions in Iowa. Power plants alone account for 29 percent of total emissions, due to the state's heavy reliance on imported coal.

Forward-thinking energy policies that promote renewable energy, energy efficiency, and cleaner fossil fuel generation can significantly reduce emissions from these sources. Clean energy policies for Iowa should:

- **Increase Iowa's renewable electricity standard** so that all electricity suppliers gradually increase the share of electricity generated from clean, renewable sources such

CO₂ emissions from power plants could be reduced by 56 percent by 2020.

as wind, solar, and bioenergy to 20 percent by 2020. A renewable standard would provide significant economic benefits to farmers and rural areas. To date, 13 states (including Iowa) have enacted renewable electricity standards. Iowa

proudly led the country with a 2 percent standard, established in 1983. But that standard has already been met and is now one of the lowest such standards in the United States. Minnesota recently increased its standard for the state's largest utility to about 19 percent renewable electricity by 2015 and Wisconsin is considering increasing its standard to 10 percent by 2013.

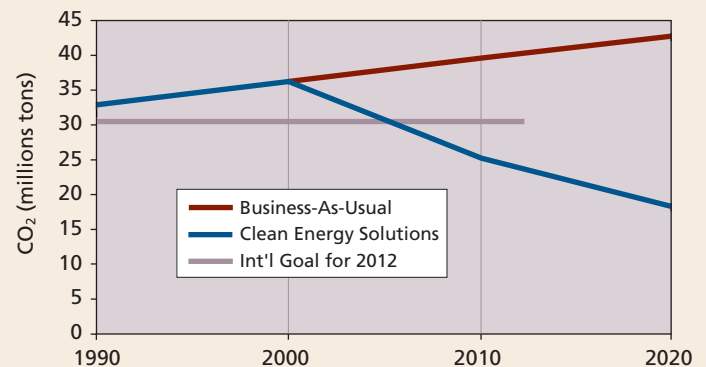
- **Ensure state government leads by example.** In 2005, Governor Vilsack signed Executive Order Number 41 directing state agencies to improve their current practices of conserving energy. Among other things, the Order requires at least ten percent of agencies' electric consumption come from renewable energy resources; that they purchase alternative fuel or hybrid-electric vehicles for 100 percent of their non-law enforcement light duty fleet and increase their usage of biodiesel.

- **Strengthen and enforce state energy efficiency building codes and standards** to incorporate advances in technology and building practices to the most recent standards recommended by the International Energy Conservation Code.

- **Increase Iowa's clean energy investment funds** to support investments in energy-efficient and renewable energy technologies. A charge of 0.4¢ per kWh on all consumer electricity bills (about \$2 per month for a typical household) would create a fund to finance renewable energy projects and efficiency improvements in homes, businesses, and industries, and on farms. Savings on consumer energy bills from installing more efficient lighting, appliance, cooling, motor, and other technologies will offset this cost.

Union of Concerned Scientists

Power Plant CO₂ Emission Reductions from Adopting Clean Energy Solutions in Iowa



Source: Environmental Law & Policy Center, 2001

- **Provide incentives for cleaner fossil fuel generation**, such as combined heat and power (CHP) systems, which produce both heat and electricity for a facility or surrounding community from a single fuel source. Some CHP technologies can reach efficiency levels of greater than 80 percent compared with the 33 percent average for conventional facilities.

- **Ensure that transmission policies treat renewable resources fairly** and account for their intermittent nature, remote locations, or smaller scale.

- **Support the same policies at the federal level**, which would create a level national playing field and additional economic opportunities for clean energy in Iowa.

These global warming solutions have several valuable benefits including cleaner air, economic development, job growth, and, often, financial savings to consumers and industry. A comprehensive study by the Environmental Law and Policy Center in Chicago found that by implementing similar policies in Iowa, CO₂ emissions from power plants could be cut 56 percent by 2020 relative to "business as usual." They would also reduce sulfur dioxide and nitrogen oxide emissions, which cause acid rain and smog, by more than 60 percent, and mercury emissions, while creating 12,500 new jobs and generating nearly \$1 billion per year in increased economic activity.

Vehicle Solutions

With nearly 20 percent of Iowa's heat-trapping emissions coming from the transportation sector, it is critically important to reduce emissions from the cars we drive. To do this, we should:

- **Increase fuel economy standards.** Today's federal fuel economy standards save more than 720 million tons of heat-trapping gases per year in the United States, the equivalent of taking nearly 80 million cars off the road. Au-

tomakers have the technology in hand to deliver additional gas mileage improvements in their fleets, thereby reducing heat-trapping gas emissions and oil consumption while saving consumers money at the pump. Higher standards will help automakers get on track with the worldwide trend toward addressing the global warming and energy security implications of vehicles. Iowa's congressional delegation should be encouraged to support these efforts.

- **Provide state incentives for hybrids and other fuel-efficient vehicles.** Tax incentives or rebates pegged to fuel economy increases or reductions in global warming gases can attract Iowa buyers to less-polluting vehicles and help build the market for automakers. This type of program can also cut gasoline bills and global warming emissions from new vehicles by as much as 50 percent.

- **Promote a move toward sustainable biofuels production.** Iowa is a leader in production of ethanol and biodiesel, and last year, the state legislature passed a renewable fuels standard requiring 25 percent of all of the fuel sold in the state to be biofuels by 2019. Now, the state must encourage a move to a more diversified efficient approach to producing biofuels by utilizing cellulose to ethanol technology and higher yield oil seed crops.

- **Support research and demonstration projects** for fuel cells and other advanced vehicle technologies, which have the potential to deliver pollution-free transportation while boosting local economies with a new high-technology industry.

- **Pursue smart growth projects** that reduce the need to drive, such as rideshare, bicycle, and pedestrian programs, mass transit promotions, and parking management.

Agricultural and Land-Use Solutions

Agriculture is responsible for 18 percent of total heat-trapping emissions in Iowa. Methane emissions from domestic animals and animal waste make up 61 percent of agricultural emissions. Nitrous oxide emissions, primarily from the breakdown of nitrogen fertilizers, are the next largest source at 25 percent, followed by CO₂ emissions from energy use at 14 percent. Aside from climate benefits,

many of the solutions discussed below would also reduce soil erosion, improve air and water quality, and increase biodiversity. The most promising strategies suggest Iowa should:

- **Reduce methane emissions from livestock and livestock waste.** Hog operations in Iowa are responsible for an estimated 87 percent of total methane emissions from animals. The Iowa Department of Natural Resources, Iowa State University Extension, the U.S. Environmental Protection Agency, and some utilities offer incentives and programs to reduce emissions by converting the methane gas into energy.



Iowa Department of Natural Resources

For example, a system was recently installed at Top Deck Farms in Westgate, Iowa that is capturing methane from 700 dairy cows to produce enough electricity for 20 homes.

- **Expand programs to reduce nitrogen fertilizer use.** Between 1985 and 1995, Iowa had several programs in place that reduced nitrogen fertilizer use by over two million tons, saved farmers \$363 million, and reduced heat-trapping emissions by 10 million tons per year, without affecting corn yields. However, since 1998, nitrogen application and heat-trapping emissions have increased. The University of Iowa recommends setting a target to reduce nitrogen fertilizer application rates by 1 percent per year, by continuing and expanding extension education and programs like those sponsored by the Leopold Center for Sustainable Agriculture.

- **Increase energy efficiency and renewable energy production on the farm.** Significant incentives are available from the USDA under the 2002 Farm Bill to support investments in energy efficiency and renewable energy production on the farm. In 2006, the USDA provided \$17.5 million in Renewable Energy and Energy Efficiency grants to 375 recipients in 36 states, with Iowa receiving grants for 51

Union of Concerned Scientists



Warren Gretz, NREL

projects. The state offers a tax credit for farmer-owned projects to supplement these federal funds, but more incentives are needed to support local ownership and keep profits from renewable energy in the state.

- **Improve soil management practices.** Numerous studies have shown that certain best practices in soil management such as no-till, low-input, and use of cover crops can enhance short-term soil carbon storage.

- **Provide incentives to reforest marginal lands.** About three-quarters of Iowa's forests have been cleared since pre-settlement times. With just over two million acres of public and private forestlands remaining in Iowa, there are substantial opportunities for storing carbon in trees, forest soils, and sustainable crops such as switchgrass. A University of Iowa study recommends establishing a state policy to convert one million acres of marginal lands into native forests and to plant 200,000 acres of riparian zone buffer strips with hybrid poplars or switchgrass, which could reduce CO₂ emissions by 7.3 million tons per year. Federal funding is available from the USDA's Conservation Reserve Program, the U.S. Forest Service's Forest Legacy Program, and other programs to help meet these targets.

Integrated Strategies

There are several initiatives that address multiple sources of emissions and can play an important role in reducing heat-trapping emissions in Iowa.

- **Update state climate change action plan.** In 1996, Iowa completed a climate change action plan that includes many of the climate solutions discussed here. This plan should be regularly updated and will require strong support for implementation.

- **Establish a "Cap and Trade" system.** An emissions permit trading program, commonly referred to as a "cap-and-trade" system, would draw on the power of the market to reduce heat-trapping emissions in a cost-effective and flexible manner. The "cap" sets limits on emissions from a designated group of polluters, such as power plants, and the "trade" allows the companies to cost-effectively meet their emission reductions goals. If designed well, such a system

also provides incentives for investments in cleaner, more efficient technologies. A market-based cap-and-trade system has been used before to successfully address the acid rain and other pollution problems. At the federal level, the Iowa delegation should support bills introduced in the House and Senate that would help to prevent the worst effects of global warming by ensuring an 80 percent reduction in heat-trapping emissions below 2000 levels by 2050. Iowa should also establish a registry for tracking heat-trapping emissions, so businesses will have an incentive to adopt solutions now and receive credit in the future trading systems.

- **Regulating CO₂ with other pollutants.** In 2002, Congress introduced a bill to reduce power plant emissions responsible for global warming, acid rain, smog, and mercury contamination. This legislation, known as the Clean Power Act (S. 556) and the Clean Smokestacks Act (H.R. 1256), would cut CO₂ emissions by 25 percent—reducing them to 1990 levels, nitrogen oxide and sulfur dioxide emissions by 75 percent, and mercury emissions by 90 percent. Addressing all four major pollutants at once allows utilities to take an integrated approach to pollution control, reducing compliance costs while greatly improving public health. Iowa's congressional delegation should be encouraged to support these efforts.

Responsible Action Starts Today

Global warming is under way and is already causing changes to our environment. However, the size of this challenge should not paralyze us. Innovative, affordable, and prudent solutions are available to help reduce the severity of climate change. Leadership at all levels in Iowa is needed to solve this human-caused problem. Citizens must take action in their own lives and insist that local and national elected leaders and corporate CEOs implement responsible solutions that will slow climate change.

Immediate steps are necessary to increase the health and resilience of ecological and economic systems vital to the region, and we must begin planning and preparing to manage those future changes that cannot be avoided. By acting now, we can protect the rich natural heritage, vibrant economy, and well being of people and communities throughout Iowa.



Two Brattle Square
Cambridge, MA 02238-9105
617-547-5552
ucs@ucsusa.org
www.ucsusa.org

This Iowa Solutions fact sheet was written by Steve Clemmer (UCS). A companion piece, *Climate Change in the Hawkeye State*, was published in January 2004 by the Union of Concerned Scientists. The Impacts Summary was written by climate science and impacts experts Dr. Susanne Moser (NCAR), in collaboration with Katharine Hayhoe (ATMOS Research) and Dr. Michelle Wander (University of Illinois at Urbana-Champaign).

Steve Clemmer (617) 547-5552 • Dr. Susanne Moser (303) 497-8132

The referenced version is available from UCS at www.ucsusa.org/iowa or call (617) 547-5552.