Climate Change & the Delaware Action Plan

What are Greenhouse Gases?

The principal greenhouse gases (GHGs) are carbon dioxide, water vapor, methane and nitrous oxide. These gases normally protect life on earth by regulating surface temperature.

Scientific evidence shows GHG levels are rising. Atmospheric carbon dioxide is now **30% greater** than in pre-industrial times, methane has doubled, and nitrous oxide is 15% higher.

Burning fossil fuels and land clearing have been identified as the chief causes of increased atmospheric concentrations of carbon dioxide – the principal GHG linked to climate change.

How Do Greenhouse Gases Affect our Climate?

Higher concentrations of GHGs intensify the greenhouse effect, increasing the amount of heat retained by the atmosphere. As a result, global temperatures have risen by 1.3˚-1.8˚F this century.

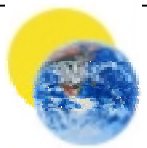
Impacts of Climate Change

Climate change will influence human health, biodiversity, water resources, agriculture, ecosystems, and world food supplies. These impacts will result in adverse socio-economic changes across the globe.

Delaware is vulnerable to climate change in several ways. Temperatures could increase by 3˚-4˚F degrees by 2100, which would mean a greater number of extremely hot days in the summer and a 15% to 40% increase in precipitation year round. Ground level ozone in the state exceeds national health standards currently and could worsen. Sea level rise threatens Delaware's 381 miles of coastline with flooding of low-elevation coastal areas, beach erosion, and increased storm damage.

Global Action on Climate Change

International negotiations to reduce impacts of climate change have resulted in the Kyoto Protocol to reduce greenhouse gas emissions by industrialized nations. The U.S. target is to reduce CO_2 emissions 7% below 1990 levels by 2012, which is about a 30% decrease from forecasted emissions for that year.



The Delaware Climate Change Action Plan

The U.S. Environmental Protection Agency (EPA) supported the University of Delaware's Center for Energy and Environmental Policy (CEEP) and the Delaware Energy Office to work with the Delaware Climate Change Consortium (DCCC) in developing a Climate Change Action Plan. The DCCC consists of community leaders, union representatives, industry and government officials, and researchers who are working together to find consensus-based approaches to reducing Delaware's GHG emissions.

Ways to Reduce Delaware Emissions

Based on current energy usage trends, CEEP forecasts that Delaware's carbon dioxide emissions in 2010 will total almost 20 million metric tons. This is a 22% increase over emission levels in 1990.

Research by CEEP has identified a range of measures by which Delaware can reduce its greenhouse gas emissions in each sector. Most of these measures involve saving energy.

Industrial Sector

Industrial emissions can be reduced by technology upgrades, operation and maintenance changes, and improved facility management.

Energy efficiency and savings have the greatest potential in the following areas: boiler and steam systems, heat recovery & containment, space conditioning, air compressors, motors, and lighting.

Residential/Commercial Sector

High efficiency appliances and lighting offer substantial savings in energy and cost to the consumer, while reducing greenhouse gas emissions. Switching to more efficient fuels, such as natural gas for heating and cooking, also will reduce overall emissions. Building-integrated photovoltaics (solar cells) can reduce peak energy demand and lower GHG emissions.

Transportation Sector

Greenhouse gas reduction measures for the transportation sector include fuel efficiency improvements, the introduction of alternative fuel vehicles, and transportation control measures that reduce the number and length of trips. In addition, increased ridesharing, greater use of public transit, and development planning that reduces urban sprawl will lower GHG emissions from this sector.

Utility Sector

Reductions in energy usage by residential, commercial, and industrial users will greatly reduce the demand for power from utilities. A requirement that 1% of power generation come from renewables would begin the process of shifting Delaware to *green* energy sources. Switching Delaware's coal fired power plants to natural gas will also lower emissions.

Waste Reduction

As garbage decomposes in landfills, greenhouse gases are released. Waste reduction and recycling programs can be highly effective in reducing garbage volumes, leading to lower emissions.

Market-based and regulatory policies and packaging reduction/redesign are possible approaches for increasing recycling and reducing resource usage.

Forest Protection

As part of photosynthesis, trees store carbon in their leaves, wood, and roots. Protecting forests is an important way to offset a portion of the carbon released into the atmosphere by fossil fuel combustion. Planting additional trees and protecting existing forests will increase the total size of Delaware's carbon store.

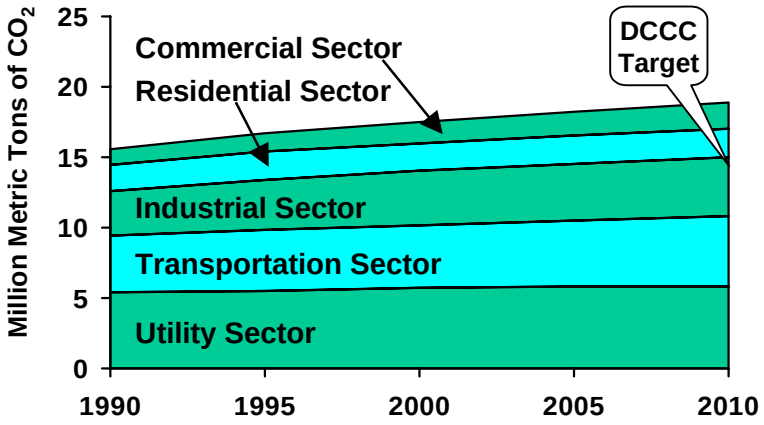
Action Plan Target for Delaware

Implementing the Action Plan will reduce CO_2 emissions at low cost to consumers. This will be achieved through energy-saving technologies that will significantly reduce CO_2 emissions in a cost-effective manner. The Action Plan identifies measures that typically cost 3¢-5¢ per kWh saved, which is cheaper than the 6¢-9¢ per kWh currently paid by Delaware consumers to use electricity. Moreover, the energy saved by the Action Plan will reduce other emissions such as SO_2 that contribute to Delaware's difficulties in meeting the U.S. EPA's ozone standards. CEEP has estimated that the CO_2 reductions of 4.1 million metric tons will be accompanied by a reduction in SO_2 emissions of 16.2 thousand metric tons, or 27% of current SO_2 emissions.

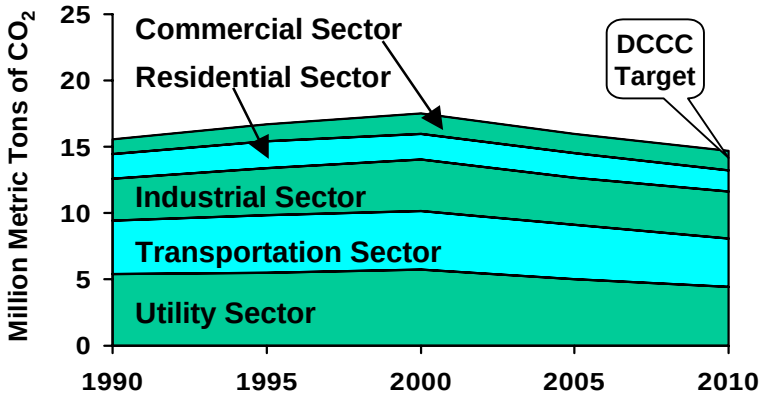
1990 Emissions:	**15.6 mmt CO_2**
2010 Forecast Emissions:	**18.8 mmt CO_2**
2010 Emission Reduction to meet DCCC Target:	**23%**

Delaware's Action Plan

Business As Usual - "Do Nothing" Option



Implementing 65% of the Action Plan



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