

# NEWS in Science and Technology

from the



## CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

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The following is an Executive Summary of the Academy's quarterly Bulletin (Vol. 23,3) that includes topics and issues in science and technology deemed by the Academy to be both timely and relevant to Connecticut's interests. Each item is briefly summarized from press releases and reports of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Hyperlinks are included to the original online source, where more detailed information is available.

NOTE: Online versions of this newsletter and the Bulletin are available on the Academy website at [www.ctcase.org](http://www.ctcase.org).

### FEATURE ARTICLE

#### ➤ Climate Change and Connecticut

The November 2007 report issued by the Intergovernmental Panel on Climate Change (IPCC), co-recipient with Al Gore of the 2007 Nobel Peace Prize, states "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.

- The IPCC agrees that "carbon dioxide (CO<sub>2</sub>) is the most important anthropogenic greenhouse gas (GHG). Its annual emissions grew by about 80% between 1970 and 2004."
- The panel asserts that "Global increases in CO<sub>2</sub> concentrations are due primarily to fossil fuel use." Twenty-five percent of the fossil fuel used in the world is consumed by the United States, which represents less than 5% of the world's population. Although countries like China, India and parts of South America are moving towards greater fossil fuel use, per capita, the United States uses more than these highly populated, developing nations.

According to CASE member Gary Yohe, an economist at Wesleyan University in Middletown and a senior lead author for the IPCC, "The IPCC has made it clear that adaptation and mitigation are both required because the capacity to adapt will be overwhelmed by unabated climate change even in the world's most developed economies."

#### What's Being Done in Connecticut

- Governor M. Jodi Rell signed into law in June 2008 *An Act Concerning Connecticut Global Warming Solutions* (HB-5600) which mandates "reductions in state greenhouse gas emissions and changes designed to help the state achieve the reductions." (A similar bill, the Lieberman-Warner Bill, failed on the US Senate floor.) The new law calls for the following:
  - A reduction in the state's GHG emissions to at least 10% below 1990 levels by January 1, 2020 and at least 80% below 2001 levels by January 1, 2050.
  - The Department of Environmental Protection (DEP) "in consultation with the Department of Public Utility Control, shall auction all emissions allowances and invest the proceeds on behalf of electric ratepayers in energy conservation, load management and Class I renewable energy programs."
  - The Department of Transportation to investigate ways of expanding high-speed and light-rail passenger service and freight rail service within the Northeast region, including new rail corridors. (Over \$3 billion has been allocated for public transit improvements in the state.)

- The Secretary of the Office of Policy and Management, in consultation with the DEP commissioner, to develop a smart growth code that municipalities may adopt, encouraging open space preservation, mixed land uses, compact building design, and availability of public transit and other low-carbon emission transportation alternatives.

- Connecticut and nine other states along with the Eastern Canadian Provinces have begun the Regional Greenhouse Gas Initiative (RGGI), a program addressing GHG emissions, initially for power plants, using a cap-and-trade agreement. This is the first plan in the United States to cap greenhouse gas emissions from the power sector.
- The Governor's Steering Committee on Climate Change is to assess the impact of climate change on the state and recommend to the governor and legislature ways in which the state can adapt to harmful impacts.
- DEP Commissioner Gina McCarthy has, based on the Connecticut Climate Change Stakeholders' Dialogue Report, identified five focus areas including: (1) cleaner electricity generation, (2) cleaner transportation and smarter land use, (3) more efficient energy use, (4) reduced emissions from agriculture, forestry, and waste management and (5) public education.
- State building codes are being revised consistent with the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, which requires buildings and building materials to provide cost-effective energy efficiency over the life of the building.
- Governor Rell has spearheaded the OneThing Campaign to encourage everyone in Connecticut takes one small step, every day, to make a difference on issues such as consumption, conservation and the use of clean and renewable energy. Visit the OneThing website at <http://onethingct.com/> to learn more. The OneThing Expo at the CT Convention Center will take place Oct. 10-12.
- The state has also launched a website dedicated to climate change at [www.ctclimatechange.com](http://www.ctclimatechange.com)

Dennis Schain, a spokesperson for Connecticut's Department of Environmental Protection, suggests, "This issue is so much about our lifestyle. We can't point a finger at one thing. It is about all of us and how we live and how we can think differently."

Read the whole story at [www.ctcase.org/bulletin/23\\_3/23\\_3.pdf](http://www.ctcase.org/bulletin/23_3/23_3.pdf)

### NEWS FROM THE NATIONAL ACADEMIES

#### ➤ Local Emergency Plans Need to Address Role of Transit Systems

A new report from the National Research Council's Transportation Research Board, said few urban area emergency plans have focused

## CONNECTICUT SCIENCE CENTER UPDATE

Progress on the construction of the Connecticut Science Center is nothing short of extraordinary. On the exterior, the most obvious visual developments are the installation of glass and wall paneling. The building itself is nearly enclosed, with wall paneling and glass expected to be fully installed by early September. Site work also continues, with the construction of retaining walls and the connection of storm drains. On the plaza level, crews continue to construct permanent garden planters. Interior progress is equally dramatic. Walls are going up with sheetrock being taped and painted. Installation of duct-work, piping and plumbing for heating systems and electrical wiring is well under way. Fabrication of nearly 150 exhibits is 80% complete. These exhibits will comprise the Science Center's 10 unique galleries: Forces in Motion, Planet Earth, Exploring Space, Picture of Health, Smart Energy, Sight and Sound Experience, Sports Lab, Invention Dimension, A River of Life, KidSpace and a traveling exhibit gallery that will change at least twice a year. Producers of the interactive media components are also completing their work. The Science Center will begin taking reservations in early 2009 for field trips in the spring. In the meantime, check out the Science Center's resources for educators and schools on its website, [www.CTScienceCenter.org](http://www.CTScienceCenter.org).

on the role of transit systems in an emergency evacuation. These would include bus and rail systems, paratransit and demand-responsive transit, commuter rail, and ferries—all of which could play a significant role in transporting individuals without cars as well as those with special needs in times of emergency.

The committee noted that a transit systems' capacity to assist depends on the nature of the incident and its location. The report also notes that evacuating special needs populations by transit requires advance planning, working with nonprofits and social service agencies to identify groups that need assistance, and a targeted public information campaign and sheltering strategy. Local governments are required by law to develop emergency plans for evacuations and mass departure routes, and, since 2006, for populations with special needs. The committee recommends that the US Department of Homeland Security provide guidance and funds to state and local governments on regional evacuation planning that includes transit and other public transportation providers.

[[http://trb.org/news/blurb\\_detail.asp?id=9264](http://trb.org/news/blurb_detail.asp?id=9264)]

### ➤ Study Urges Continued Government Support for Hydrogen Vehicle Research and Development

A new congressionally mandated report from the National Research Council finds that a transition to hydrogen vehicles could greatly reduce US oil dependence and carbon dioxide emissions, but warns that vehicle costs are high and the United States currently lacks the infrastructure to produce and widely distribute hydrogen to consumers. The report concludes that these obstacles could be overcome with continued support for research and development and firm commitments from the automotive industry and the federal government.

The greatest possible reductions in oil usage and greenhouse gas emissions would occur under a "portfolio approach" with biofuels, fuel-efficient conventional vehicles, and hydrogen vehicles all pursued simultaneously. If accompanied by government policies driving a transition toward reduced oil use and low-carbon fuels, this could reduce

greenhouse gas emissions from cars and trucks to less than 20% of current levels and could nearly eliminate oil demand for these vehicles by 2050, the committee concludes

[[http://www.nap.edu/catalog.php?record\\_id=12922](http://www.nap.edu/catalog.php?record_id=12922)]

### ➤ Restoration of Climate Sensors Urged

To continue the study of long-term climate change, NASA and NOAA need to restore a number of sensors that were previously planned for future Earth-observing satellites but cancelled, according to a new report from the National Research Council (NRC). The report provides recommendations for a recovery strategy and stresses the need for a clearer national policy toward acquiring long-term climate records.

NOAA's next generation of satellites will commence with the launch of GOES-R in 2015. Originally, plans for this series included four satellites. However, in September 2006, following significant cost growth and estimates that the total program cost would nearly double, NOAA reduced the scope of the program, removed a key instrument on the spacecraft, and revised the procurement process so that only two satellites are guaranteed. These events prompted NASA and NOAA to ask that a committee of the NRC "prioritize capabilities, especially those related to climate research, that were lost or placed at risk following recent changes to NPOESS and the GOES-R series of polar and geostationary environmental monitoring satellites." This report reflects their findings.

[[http://www.nap.edu/catalog.php?record\\_id=129254](http://www.nap.edu/catalog.php?record_id=129254)]

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