

# ENVIRONMENTAL SYNOPSIS

## The Chairman's Corner

Rep. Scott E. Hutchinson, Chairman



Autumn has arrived, and as much as we all hate to admit it, winter won't be that far behind. We'll all be looking to use the pleasant autumn days to prepare – both inside and outside - for winter, and will be seeking ways to save energy and cut down costs.

The other day I came across a list of "99 Great Ways to Save" as provided by the American Association of Retired Persons (AARP). It seemed an opportune time to share a number of the energy saving tips on the list, as well as tips on how to make more efficient use of natural resources and fuels.

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Before temperatures get too cold, fall is a good time to get in some gardening for next spring. One way to save on mulch is to buy the torn bags one often finds at home and garden centers. These bags are often set aside and then sold at a discount. The best time to get such deals is at the end of a weekend shopping day. Bring some duct tape with you to repair the bags for the trip home.

Rather than buying costly bags of "enriched" soil to improve flower and vegetable growth, start a compost pile at home and then mix the compost with dirt to enrich your soil at a lesser price. Or, if you do not have your own composting system, see if a nearby municipal recycling center might offer compost for free. An added bonus is that composting will reduce the amount of waste disposed, reducing landfilling costs and possibly saving you money on trash removal.

We have probably heard before about lowering the thermostat in the winter, but it bears repeating. According to the list, each degree you lower the thermostat cuts the heating bill by about three percent. To feel more comfortable at lower temperatures, place pans of water near heating outlets or radiators. Moist air retains heat better and the added humidity reduces itching and dry skin, common maladies during the heating season.

(continued on page 8)

# NOTES FROM THE DIRECTOR

CRAIG D. BROOKS, EXECUTIVE DIRECTOR



Massachusetts has created a public-private partnership which has led to a 25 percent reduction in the use of disposable paper and plastic shopping bags during its first two years of existence.

In March 2009, as part of a voluntary initiative between the Massachusetts Department of Environmental Protection (MassDEP) and the Massachusetts Food Association (MFA), 12 supermarket chains have been participating in the effort by tracking annual paper and plastic bag usage. The 12 chains are composed of 384 stores which account for more than two-thirds of the industry in the state.

The mutual goal of the initiative is to reduce the number of paper and plastic shopping bags distributed by MFA's 500-plus member grocery stores and supermarkets by 33 percent by 2013.

Each supermarket chain has implemented steps to encourage the use of reusable carry-alls. These efforts include training staff to reduce unnecessary distribution of paper and plastic bags, offering reusable bags for sale, and providing cash incentives for the use of reusable bags. Many stores offer five to 10 cents off your order when you "bring back the sack".

Participating stores are also accepting used plastic bags for recycling and posting instructional signs reminding patrons to bring in their reusable totes. The supermarket chains have set up plastic bag recycling stations and accept a wide range of plastic bags, including grocery bags, newspaper bags, dry cleaning bags, retail shopping bags (with string ties and rigid

plastic handles removed), bread, cereal and produce bags, and plastic wrap from paper products and bulk items.

MassDEP estimates that 600 plastic bags are used and discarded each second, with the price of the bags being passed on to consumers. One single, reusable shopping bag holds the contents of four single-use plastic bags. If each household used just one sack each week, plastic bag usage would drop significantly in a year's time.

Most plastic films and bags are recycled into outdoor furniture, decking and railing materials for homes and businesses, according to MFA and MassDEP. Approximately 2,250 plastic bags are used on just

one typical 16 foot decking board. The paper shopping bags are recycled and used in the manufacturing of new grocery bags and cardboard boxes.

**The initiative's goal is to reduce the number of paper and plastic shopping bags distributed by 33 percent by 2013...**

**There has already been a 25 percent reduction in the first two years**

According to MassDEP, the priority is to minimize the waste stream and reduce the disposable bags through the partnership with the grocery and supermarket industry. Consumers are being offered sustainable alternatives that will further increase the reusable grocery bag trend. In the past few years, the program has shown great success in increasing the use of reusable bags in place of disposable paper and plastic. Incentives, such as gift certificates and randomly handing out raffle tickets for cash and prizes are being considered as ways to help encourage further use of reusable shopping bags.

More information on the Massachusetts program is available at [www.plasticbagrecycling.org](http://www.plasticbagrecycling.org); [www.mass.gov/dep/recycle](http://www.mass.gov/dep/recycle); and [www.mafood.com](http://www.mafood.com).

# RESEARCH BRIEFS

Each month, the committee's staff researches and prepares a number of "briefs" on several topics relevant to the Joint Conservation Committee's mission. Very often, these briefs include references to reports and further research on the topics so that readers may pursue issues on their own.

## U.S. Dead Zones Have Increased 30-Fold Over Past 50 Years

-- Tony M. Guerrieri, Research Analyst

Dead zones – areas of oxygen depleted bottom waters – have increased at an alarming rate in U.S. estuaries, coastal waters and the Great Lakes over the past 50 years, according to a report by the federal Interagency Working Group on Harmful Algal Blooms, Hypoxia and Human Health.

The report, "*Scientific Assessment of Hypoxia in U.S. Coastal Waters*", charts historic and current trends associated with hypoxia – the phenomenon whereby oxygen in water reaches such low levels that it drives sea life out of an area or kills organisms that cannot travel, creating the so-called "dead zones".

Dead zones are a concern because they can threaten fragile ecosystems and potentially jeopardize billions of dollars in economic activity. While some dead zones occur naturally, many are caused or exacerbated by chemical fertilizer runoff, sewage discharges and air pollution. Urban and suburban landscapes share the blame. The report also notes that climate change may be causing or worsening the problem.

Nitrogen and phosphorous, used to help boost crop yields in fertilizer, have long been held responsible for declining oxygen levels. The nitrogen-rich fertilizer is washed away from farmlands into rivers and ends up in the ocean, where the nitrogen compounds feed massive algae blooms. When the algae die, they sink to the ocean floor where they are consumed by microbes, which consume oxygen in the process. As the oxygen is depleted, creating hypoxia, marine life that can flee does, while life that cannot dies of asphyxiation.

Hypoxia occurs when oxygen levels dip below two to three milligrams per liter of water, although the levels vary by creature. For example, fish species such as striped bass, American shad and yellow perch all require at least five milligrams per liter of water in order to live. Blue crabs need three milligrams and worms need only one milligram.

The report suggests that incidences of hypoxia have increased tenfold in the past 50 years on a global basis, while the number of dead zones in U.S. waters is 30 times greater today than it was in 1960. Dead zones were de-

tected in nearly half of the 647 waterways assessed. Prior to 1960, there were just 12 hypoxic regions in the U.S. coastal waters; now there are more than 300.

In the U.S., the northern Gulf of Mexico has been particularly hard hit by hypoxic conditions. According to the report, that is in large part because the Mississippi River dumps high nutrient runoff from its vast drainage basin, which includes the heart of U.S. agribusiness, the Midwest.

In 1987, the northern Gulf of Mexico hypoxic area measured approximately 2,500 square miles. In 2008, the report found, its size had grown to over 8,000 square miles. The impact of the BP Deepwater Horizon oil spill on oxygen levels in the gulf was not assessed because it occurred after the report was written (April 2010). But the Gulf was already home to the largest dead zone in the world besides one in the Baltic Sea.

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**Globally, incidences of hypoxia have increased tenfold in the past 50 years, but the number of dead zones in U.S. waters is 30 times more than in 1960**

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Perhaps most alarming, hypoxia is now a serious problem along all of the nation's coasts, as well as in the Great Lakes, the report said. On the east coast, federal researchers found a four-fold increase in the number of Mid-Atlantic dead zones over the past 20 years, with 76 areas now suffering from low oxygen (up from 19 areas in the 1980s).

Most of the increases since the 1980s occurred in the North Atlantic, South Atlantic, and Pacific regions. In the last 20 years, the Pacific coast has seen a six-fold increase in the number of hypoxic sites; 37 areas on the West Coast are now having low oxygen problems. A coastal area off the border between Oregon and Washington is now the second largest dead zone in the country. That is blamed at least partly on new, regional wind patterns from climate change rather than pollution. Development of the dead zone is related to ocean upwelling – a natural process driven by winds.

Not all of the news in the report was bad, however. Following sharp declines in water quality and a growing

problem with hypoxia, a series of agreements during the last 30 years has made nutrient reduction a top priority for management of the Chesapeake Bay. According to the report, a recent assessment of water quality trends in rivers feeding the bay showed significant improvements in loadings of nitrogen (72 percent of sites showed downward trends), total phosphorus (81 percent), and sediment (43 percent), indicating that management actions are having some effect in reducing nutrients and sediments.

If properly planned and executed, adaptive management of nutrient inputs will lead to significant reductions in hypoxia, the report concluded. However, if current practices are continued, the expansion of hypoxia in coastal waters will continue and increase in severity.

The report, a joint effort by the U.S. Environmental Protection Agency, the U.S. Department of Agriculture, the U.S. Geological Survey and the Virginia Institute of Marine Science, is the first of five mandated by the Harmful Algal Bloom and Hypoxia Amendments Act of 2004. The 163-page report is available at: <http://www.whitehouse.gov/sites/default/files/microsites/ostp/hypoxia-report.pdf>.

## Ethanol Pipeline Study Finds Projects Feasible With Government Help

-- Craig D. Brooks, Executive Director

A dedicated pipeline from the Midwest to the East Coast may require financial incentives from the federal government and would also require expanded use of flexible fuel vehicles, according to a Department of Energy (DOE) study. The study fulfills a requirement under Section 243 of the Energy Independence and Security Act of 2007, which required DOE to determine whether or not, and under what circumstances, a dedicated ethanol pipeline is feasible.

The feasibility study was also due, in part, to a series of events that has greatly expanded the production of ethanol. The events are: the adoption of the Renewable Fuel Standard (RFS) Policy Act of 2005, mandating 7.5 billion gallons in 2012; the 2006 Environmental Protection Agency required phase-out of MTBE as a gasoline oxygenate; and the increasing ethanol production mandate in 2007 of 36 billion gallons by 2033. These have all led to unprecedented growth in the ethanol industry.

The major findings of the study are:

- Based on current consumption projections, it is estimated that 2.8 billion gallons per year of ethanol would be transported from the Midwest to the East Coast. For the line to be economically viable, it would need to transport 4.1 billion gallons per year.

- The estimated cost to build the pipeline is \$4.25 billion. Assuming the volume demand meets the 2.8 billion gallon projection, the pipeline would need to charge an average tariff of 28 cents per gallon, substantially more than the current average rate for ethanol transport across current modes.

- Ethanol is currently being transported by rail (66 percent), truck (29 percent) and barge (five percent), with less than one percent moving via pipeline in Florida.

- Even at lower pipeline construction costs (\$3.75 billion), significant financial incentives would be required to make the pipeline profitable if ethanol blends remain capped at 10 percent and ethanol 85 (E85) is not expanded. However, E85 is 85 percent ethanol, 15 percent gasoline. Only vehicles with fuel system components that are corrosion resistant are able to use E85.

- Potential market risks include: failure of ethanol production to meet RFS goals and/or the availability of non-ethanol biofuels to meet mandated goals; the inability to prove cellulosic ethanol technology at a commercial scale; declining demand for gasoline; and unanticipated compliance costs.

The study finds that in spite of the documented challenges and risks, a dedicated ethanol pipeline is feasible under certain circumstances. A dedicated ethanol pipeline can become a competitive option if there is adequate demand for the ethanol. However, demand for this volume of ethanol can only be achieved by opening the market for blends greater than 10 percent, the study says. Under these circumstances, a pipeline would be able to charge a competitive market rate and still provide sufficient investor return.

*"The Dedicated Ethanol Pipeline Feasibility Study"* is available at [http://www1.eere.energy.gov/biomass/pdfs/report\\_to\\_congress\\_ethanol\\_pipeline.pdf](http://www1.eere.energy.gov/biomass/pdfs/report_to_congress_ethanol_pipeline.pdf).



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# MIT Report Predicts Big Shift in the Nation's Energy Landscape

-- Tony M. Guerrieri, Research Analyst

Natural gas: there is a lot of it in the U. S., it is cleaner than the two biggest energy sources (coal for electricity and oil for transportation), and it has the potential to at least partially displace both of them. Those are the conclusions of a report by the Massachusetts Institute of Technology (MIT) in Cambridge that examines critical environmental and policy issues surrounding natural gas and its role in meeting future energy demands.

According to the MIT report, *"The Future of Natural Gas"*, the U.S. could get a running start at curbing its greenhouse gas emissions by shifting its energy mix more rapidly toward natural gas in the next few years, allowing renewable energy sources like wind and solar time to gain ground.

Such a finding represents a dramatic shift from just a decade ago. At that time, falling production rates triggered gas price spikes and speculation that the U.S. would be forced to import large quantities of liquefied natural gas from overseas. Both of those issues cast doubt on arguments that natural gas could serve as a bridge to a low-carbon future, substituting for coal until more renewable energy arrived. However, new techniques for extracting "unconventional" natural gas locked in massive U.S. shale formations have changed the picture.

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## Is natural gas going to be the bridge to a more low-carbon, renewable energy future?

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Domestic natural gas is already important; it provides 21 percent of the country's electricity, it sets the price of electricity in most regions of the country, and is relied upon heavily by industry. According to the report, natural gas' share of the electricity market is poised to grow substantially as inefficient coal-fired plants are shut down in the face of tightening emissions requirements.

The report estimates that the U.S. could reduce greenhouse gas emissions from the electricity sector by at least 10 percent by shutting down the least efficient coal-fired plants and ramping up existing gas-powered generators that are running below capacity.

Hopes are high for natural gas in part because there is so much of it. The report estimates that there are 16,200 trillion cubic feet (Tcf) of recoverable reserves worldwide, which is 150 times current annual global consumption. Gas companies could produce 9,000 Tcf of that and

make money with gas priced at \$4 per million British thermal units (Btu's).

The report suggests there are 650 Tcf of this gas in the U.S., 400 Tcf of which is economically recoverable with gas prices at \$6 per million Btu's. That puts the U. S. behind only Russia and the Middle East in terms of supply. Around 15 percent of the U.S. resource is in Alaska.

New shale gas fields could reconfigure the national map of gas producers. Gas production in the Marcellus Shale and other burgeoning gas fields in the Northeast is set to rise 78 percent by 2030, according to the report.

Currently, the U.S. consumes about 22.8 Tcf of natural gas per year, and it holds reserves of about 2,100 Tcf, the report found. Based on current domestic consumption rates, the report estimates this could last the country for 92 years.

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## One reason hopes are high for an increased role for natural gas is that there is so much of it

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Natural gas will have a harder time replacing oil as a transportation fuel, but there are movements to promote burning it in the engines of cars and trucks. The report noted that the only natural gas car sold by a major car company in the U. S., the Honda GX, costs an extra \$5,500, while the VW Passat TSI Eco-fuel, sold only in Europe, costs \$3,700 extra. Converting a gasoline vehicle to natural gas is also much more expensive in the U. S. than in Europe, the report said, and suggests that the reasons for that be examined.

The MIT report projects natural gas vehicles will comprise 15 percent of the private vehicle fleet by 2050. While natural gas could be used to fuel fleet vehicles, buses and long-haul trucks, the report said, its greatest potential for growth is in producing electricity.

The report found that with a "level playing field" approach to energy pricing, in which the price of energy sources are set to reflect the carbon dioxide they produce, gas could almost entirely displace coal burning in the U. S. by 2035.

In the very long run, the report states, very tight carbon constraints will likely phase out natural gas power generation in favor of zero-carbon or extremely low-carbon energy sources. Under such a system, natural gas consumption would begin to taper off in 2045. For the next several decades, however, natural gas will play a crucial role in enabling very substantial reductions in carbon emissions.

The 83-page MIT report is available at: <http://web.mit.edu/mitei/research/studies/report-natural-gas.pdf>.

# EPA Cites Nearly \$300 Billion "Needs" Gap for Clean Water Infrastructure

-- Craig D. Brooks, Executive Director

An Environmental Protection Agency (EPA) report to Congress indicates a spending shortfall of \$298.1 billion over the next 20 years for clean water infrastructure, an increase of 17 percent from the previous survey.

The "Clean Watersheds Needs Survey Report to Congress" is released every four years. The most recent report is the 2008 report, which assessed needs as of January 1, 2008, and provides an analysis of unfunded capital costs for wastewater and stormwater treatment and collection. The shortfall number reflects capital needs for publically owned wastewater collection and treatment facilities, combined sewer overflow connections and stormwater management. The survey provides essential information about wastewater treatment and pollution control needs over the next 20 years.

According to the National Association of Clean Water Agencies (NACWA), the clean water community is facing increasing financial capability and affordability problems during the economic downturn. The report suggests that the federal government must become a long-term partner in developing a sustainable funding mechanism to address the growing infrastructure funding gap. According to NACWA, the report alters the landscape for pending legislation in the Senate, which includes a funding formula based on previous needs surveys. The gap is growing and this survey suggests that the water infrastructure needs are much larger than anticipated.

The Senate Environment and Public Works Committee has approved the Water Infrastructure Financing Act, which would authorize \$38.5 billion over five years for state clean water and drinking water revolving funds and other programs to repair infrastructure and improve water quality. The clean water state revolving fund is one of many supplemental federal, state, and local funding sources. Ac-

ording to the report, from July 1, 2004 through June 30, 2008, EPA provided an annual average of \$1.1 billion in grants to state clean water revolving fund programs. States combined these funds with state matching funds, bond proceeds, and loan repayments to provide assistance to local communities, mostly in the form of loans. In the same period, this assistance amounted to about \$5.5 billion annually.

According to U.S. Census Bureau estimates cited in the report for 2002-2006, local governments spent about \$15 billion annually to address capital wastewater needs and about \$2 billion annually to address capital stormwater needs.

The report suggests that the needs for wastewater treatment, pipe repairs and new pipes are \$187.9 billion, an increase of \$28.6 billion (18 percent) since 2004. Of this increase, \$16.3 billion is for advanced wastewater treatment needs, \$7 billion is for secondary wastewater treatment needs, and \$4.8 billion is for pipe repair.

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**The \$298.1 billion shortfall is an increase of 17 percent from the previous survey**

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These needs are mainly for improvements to rehabilitate aging infrastructure, to meet more protective water quality standards, and to respond to and prepare for population growth. Florida, Illinois, Ohio, Pennsylvania and Texas each have needs in excess of \$10 billion. Pennsylvania, New Jersey and New York are among the states with the largest increases in needs since 2004, each with an increase of more than \$2 billion.

Over the next two years, the report said, EPA and the state clean water needs survey 2012 workgroup will plan how to alter the survey to meet the emerging needs and to enhance public data access. Potential changes include tracking wastewater treatment plant energy efficiency projects and the underreporting of needs.

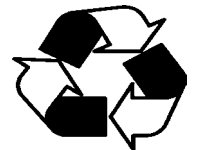
The needs survey is available at <http://www.epa.gov/cwns/2008reportdata.htm>.

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# ON THE HORIZON ...

A LOOK AT UPCOMING EVENTS

No events are scheduled at this time.

Check the Committee website at <http://jcc.legis.state.pa.us> for events that may be added to the schedule.

A REVIEW OF SOME  
MEMORABLE COMMITTEE  
EVENTS

## COMMITTEE CHRONICLES ...

The most recent Environmental Issues Forum sponsored by the Joint Legislative Air and Water Pollution Control and Conservation Committee (Committee) was held in September.

The forum featured a presentation entitled "Climate Change Policy and Forests – Possibilities and Challenges."

*The guest speaker was Matt Smith, (pictured at right), Vice-president of Forest Operations for the Finite Carbon Corporation, a forest carbon development company working with landowners in creating and monetizing carbon credits and carbon offsets. Finite Carbon has offices in Wayne, PA.*



Smith reviewed the development of climate change programs in the United States including the use of offsets in cap and trade programs, how forests work as offsets, recent policy shifts in climate policy, and an outlook on the future of carbon caps and the use of forest offsets to meet carbon reduction goals.



*As shown in the photo at left, after the forum, Smith (left) fielded questions from Committee member Rep. Ron Miller, one of several members in attendance.*

Handouts from the forum are available by e-mailing Geoff MacLaughlin at [gmaclaughlin@jcc.legis.state.pa.us](mailto:gmaclaughlin@jcc.legis.state.pa.us).

You can save water and lower your water bill in a couple of ways. First, police your own home to stop dripping faucets. According to the U.S. Geological Survey, 60 drips a minute will waste about 6,428 gallons of water per year. Also, if your home's toilets are older, place a plastic bottle full of water weighted with pebbles in your toilet tank. The AARP list points out that if you were to drink eight glasses of water a day from bottled water, it could cost as much as \$1,400 a year (not to mention having to dispose of the plastic bottles). The same amount of tap water should cost you less than \$1, according to the list. To reduce water usage further, connect rain barrels to your home's storm gutters. This will collect water for use on your lawn, garden or to wash the car.

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**For AARP's complete list of tips for saving, visit the website [www.aarp.org/savemoney](http://www.aarp.org/savemoney)**

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Speaking of cars, the savings list notes that idling your car's engine for 10 seconds uses as much gas as restarting it, and two minutes of idling uses enough fuel to drive a mile. So, if you are waiting for someone or doing something else before starting out, turn the engine off until you are ready to go. Also, fuel efficiency drops about an average five miles-per-gallon for each 10 mile increase in speed over 55 miles-per-hour. Jackrabbit starts and stops further reduce fuel efficiency about an additional three miles-per-gallon. And, for every 100 extra pounds of weight, cars typically lose one to two percent of fuel efficiency. So, remove unneeded items from your trunk when traveling.

The AARP list also offers cost saving tips on areas such as insurance, travel, health care, taxes and shopping, among others. Savers from around the country who have devised their own cost cutting methods also share their advice. Why not check it out. The website address is listed above, and the complete list offers far more than 99 ways to save.



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